

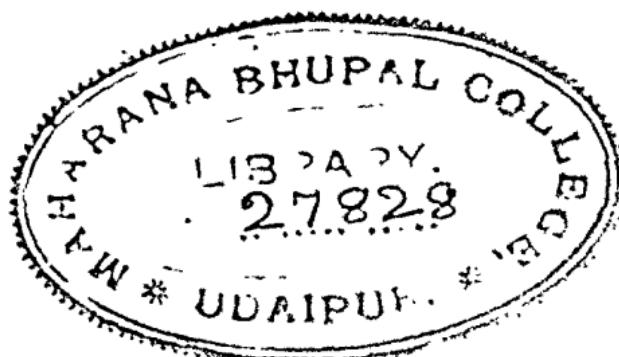
General Editor : R. J. UNSTEAD

LOOKING AT THE WORLD

by

JEAN and DAVID GADSBY

WITH FIFTEEN COLOUR PLATES
AND OVER 1000 ILLUSTRATIONS
IN THE TEXT

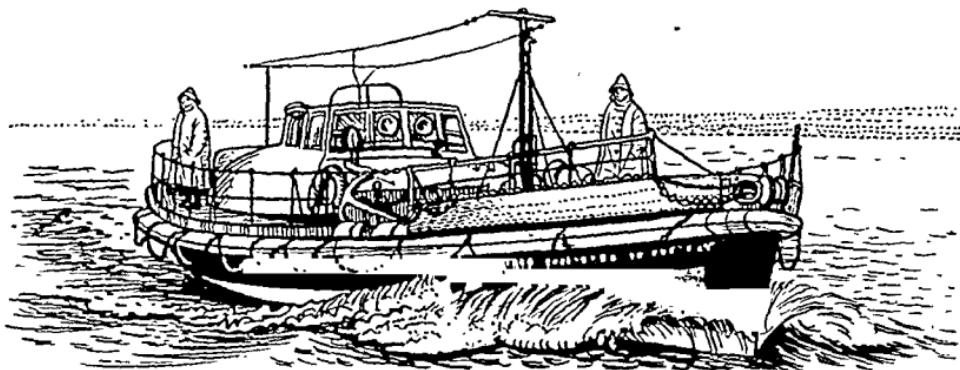


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INTRODUCTION

THIS IS A BOOK about the world today. It shows how people live in every kind of land, from the hot forests of Brazil to the frozen wastes of Russia, from the deserts of Australia to the crowded cities of North America.

It has been written for children and it contains more than 1000 pictures. These include photographs, drawings, maps and diagrams, each one carefully chosen or specially drawn for this book.

The book is in four parts :

Part 1 tells of the lives of children of other lands.

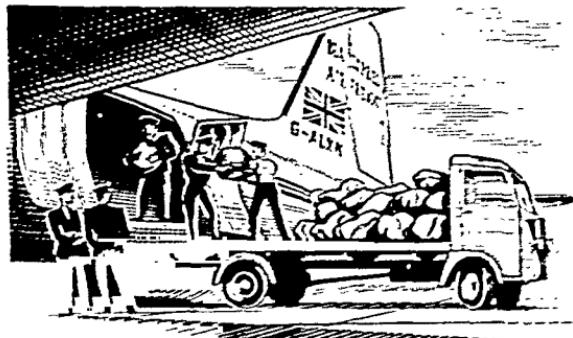
Part 2 tells of things we eat and use in our daily lives.

Part 3 tells of Britain today.

Part 4 shows how people live in parts of the world which differ widely in climate and development.

Throughout the four parts there are chapters about maps, the weather, the seasons, and travel in the world today.

R. J. UNSTEAD



CONTENTS

A complete list of the contents of each part will be found at the beginning of each of the four parts. A summary of the contents of the complete book is given on pages vii to x.

PART ONE
LOOKING AT OTHER CHILDREN
PAGE 1

PART TWO
LOOKING AT EVERYDAY THINGS
PAGE 65

PART THREE
LOOKING AT BRITAIN
PAGE 145

PART FOUR
LOOKING AT THE WORLD TODAY
PAGE 241

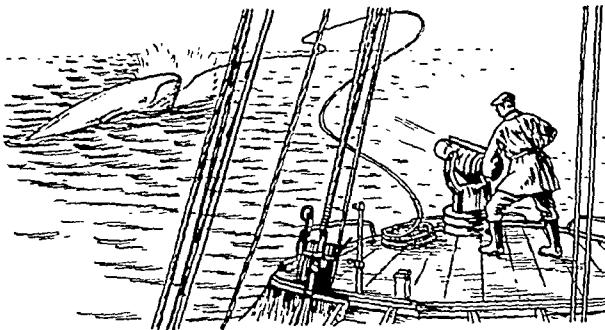
INDEX
PAGE 353

AFRICA

	PAGE
Ghana	285
South Africa	301
The River Nile	296



Sufferers from leprosy being treated at a "Land-Rover clinic", Ghana



Firing a harpoon at a whale in the Antarctic seas

ASIA

	PAGE		PAGE
Arabia	25, 138	Japan	305
Ceylon	134	Malaya	74
China	43	Pakistan	264
India	53, 264	Russia	324
Israel	290		



The old part of a Chinese town

AUSTRALASIA

	PAGE
Australia	126, 271
Fiji	281
New Zealand	334



A Fijian removing coconut kernels from their husks

EUROPE

Britain

Factories	<i>pages</i> 92, 100, 161	Regions	<i>page</i> 230
Houses	<i>page</i> 93	Weather	<i>page</i> 197
Transport	<i>page</i> 220	Fishing	<i>pages</i> 110, 215
Farms	<i>pages</i> 34, 124, 200	A Town and its Services	<i>page</i> 154

Denmark

page 105 A Train Journey across Europe

France

page 310 *page* 310

Holland

page 59 *page* 49

Italy

page 315 *page* 312



The Forth Bridge, Scotland



Picking cotton by machine and by hand, in the U.S.A.

NORTH AMERICA

Canada *pages* 70, 345

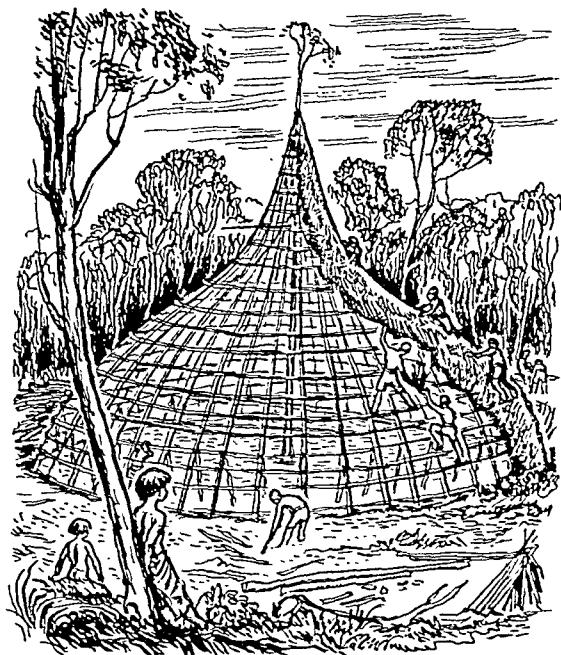
United States of America *pages* 87, 277, 318
Alaska *page* 344

SOUTH AMERICA

	PAGE
Amazon Forest	13
The Andes	331
Argentina	83, 333
Brazil	260
Chile	330
West Indies	81, 118

MAPS AND MAP MAKING

pages 31, 131, 149, 254



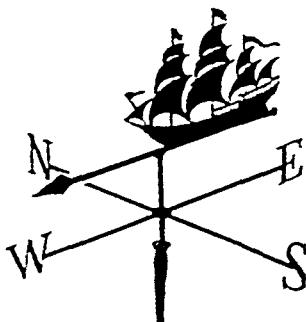
Building a hut in the Amazon Forest



A river in Britain

PHYSICAL GEOGRAPHY

	PAGE		PAGE
Day, Night and the Seasons	194	Rain	12
A River	78	The Shape of the Earth	98
The Seasons	5	Valley and Hill	122
The Weather	115, 197	Water	295
Winds and Directions	108		



A weather vane

LET'S REMEMBER

pages 63, 142, 239, 299, 340, 351



Working in a glasshouse in Britain

ILLUSTRATIONS

IN COLOUR BY G. W. BACON

In the Amazon Forest

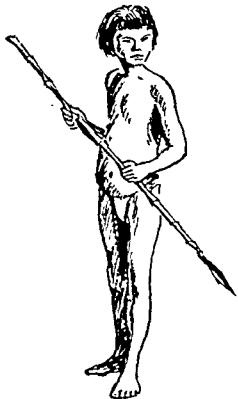
Frontispiece
facing page

Arabs of the Desert	26
A Farm in Norway	49
In an Indian Bazaar	58
Cutting Bananas in Jamaica	81
Building a House in Britain	96
Bringing the Catch aboard a Trawler	113
A Sheep Farm in Australia	128
A Busy Street in Britain	161
An Assembly Line in a Car Factory	176
A Market Garden in Summer	209
A Diesel Train leaving Waverley Station, Edinburgh <i>(by John S. Smith)</i>	224
One-Inch Ordnance Survey Map (<i>Crown copyright</i>)	256
A Village in Ghana	288
A Japanese Family at Home	305

and over one thousand other illustrations in the text

PART 1

LOOKING AT OTHER CHILDREN





ACKNOWLEDGEMENTS

The drawings in this part are by Stanley Smith, J. C. B. Knight, Frank Varty, Norman Meredith, R. A. Lake, F. W. Wentworth-Sheilds, H. Swinnerton Cook, Mona Moore, Peter Dunbar, D. Saunders, Leslie Weller, Geoffrey Whittam and R. Evans.

The publishers are grateful to The Association of Agriculture, for allowing them to base the farm picture and plan on page 35 on one of the farms in their Adoption Scheme. They are also grateful to the following for permission to reproduce photographs : Fox Photos Ltd., pp. 5, 11, 49 ; The Central Office of Information, p. 6 ; The Sport and General Press Agency Ltd., pp. 33, 41 ; *The Farmer and Stockbreeder*, p. 37 ; *The Times*, p. 42 ; Paul Popper Ltd., p. 52 ; the Royal Netherlands Embassy, pp. 59, 61, 62 ; the Automobile Association, p. 7 (a and c) ; *Radio Times* Hulton Picture Library, p. 7. (b) ; Camera Press, pp. 13, 48 ; the Royal Danish Embassy, p. 19 ; Aerofilms, p. 58 ; the Royal Netherlands Embassy, p. 61. The drawing of the harrow on page 39 is reproduced by permission of Massey-Harris-Ferguson Ltd.



CONTENTS OF PART 1

	page
About Part 1	4
The Seasons : Autumn	5
Winter	7
Spring	8
Summer	9
Seasons and Shadows	10
Rain	12
Peko of the Amazon Forest	13
Kara of Greenland	19
Nasir of Arabia	25
How to Draw Plans	31
David of Great Britain	34
Chai of China	43
Sigrid of Norway	49
Ashok of India	53
Piet of Holland	59
Let's Remember Part 1	63

ABOUT PART 1

This part is about the children of many lands. It tells you what they wear and what they eat ; it tells you about their homes and about the work their fathers do.

One of these children lives in a hot, wet forest ; another lives in a very cold land. One child's home is a tent ; another lives in a house made of logs.

One child lives in a house made of bamboo and mud ; an ox pulls his father's plough. Another child lives in a brick house, and his father uses a tractor to pull his plough. The father of one of these children grows rice ; another grows flower bulbs.

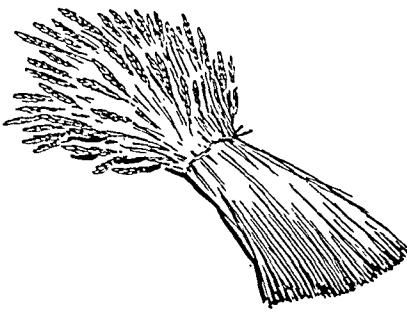
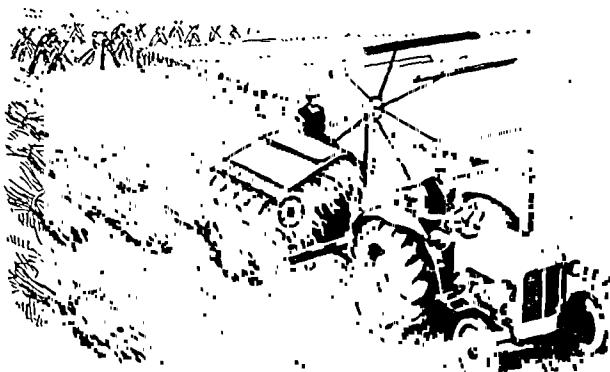
In this part you will also read about the seasons, and shadows, about the sun, and the rain, and you will learn how to draw plans.



THE SEASONS

AUTUMN

In the early Autumn the farmers are busy with the harvest. When the ripe corn is being cut everyone hopes for fine weather.



A sheaf of wheat

The leaves on the trees turn red, yellow and brown in the Autumn and fall to the ground. In the town the roadmen work hard to sweep them up, so that they do not block the gutters.

Some of the trees keep their leaves all the year round. They are called evergreens. Holly and fir trees are evergreen.

The tractor pulls a binder which bundles the corn into sheaves. The sheaves are put into stooks so that they will dry and ripen in the sun. From corn we get flour to make bread and biscuits. Porridge, and food for the farm animals are made from corn.



THE SEASONS



AUTUMN

In the Autumn many kinds of fruit are ripe and ready for eating. Apples and pears are picked in the orchards. They are packed in boxes and sent to market.

“Conkers” are ripe on the horse-chestnut trees, and children gather ripe blackberries in the woods and hedges.

We see less and less of the sun each day, and so the days grow cooler. At home we need the lights on earlier every day.

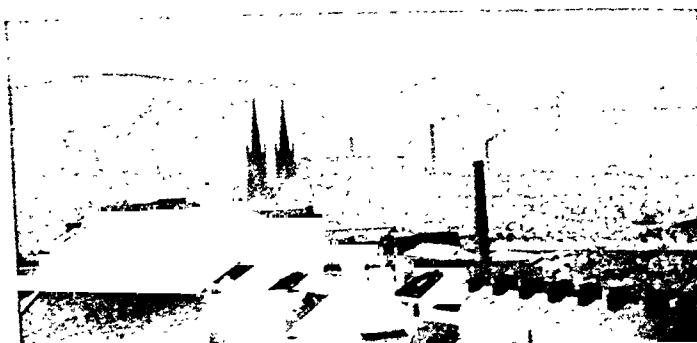
In the parks the keepers dig up the dead flowers and burn them. Some plants are split up so that they will flower well next year.



Blackberries

Sometimes there are thick fogs, and cars need their lights on even during the day.

In the towns the smoke from the chimneys makes the fogs thicker.



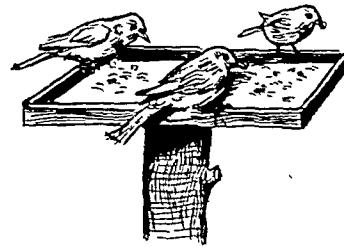
WINTER

In Winter it is dark when we get up in the morning, and dark when we go to bed. The fields look very bare. The grass is too short for the cows to eat, and the farmers feed them with hay. Car and lorry drivers have to be careful when the roads are icy. Have you seen men throwing sand on the roads to make them safer?

Robins and sparrows are very tame, and they wait near our houses for crumbs. You can help to feed the birds by putting out bread and fresh water every day.



An A.A. patrol man reports a blocked road



In the country the snow often piles up in drifts, and the roads are blocked. Sometimes the snowploughs cannot clear the roads, and helicopters have to take food to the villages which are cut off.



SPRING

Spring is always an exciting time. The days grow longer, for the sun climbs higher in the sky every day. Soon you can play outdoors after tea.

Father digs the garden. He plants onion, lettuce, and carrot seed, and sows early peas, and flower seeds.

Birds build their nests and lay their eggs. When the chicks hatch out, the birds fly busily to and fro carrying food to them.

The crocuses and snowdrops are the first flowers to open. Soon the primroses and daffodils are in flower, and the leaves of the horse-chestnut trees begin to unfold.



The chimney sweep cleans the chimneys, and clears away the soot from the winter fires. Mother notices how dusty everywhere looks in the sunlight. She sets to work "spring-cleaning" —scrubbing, dusting and polishing every room.

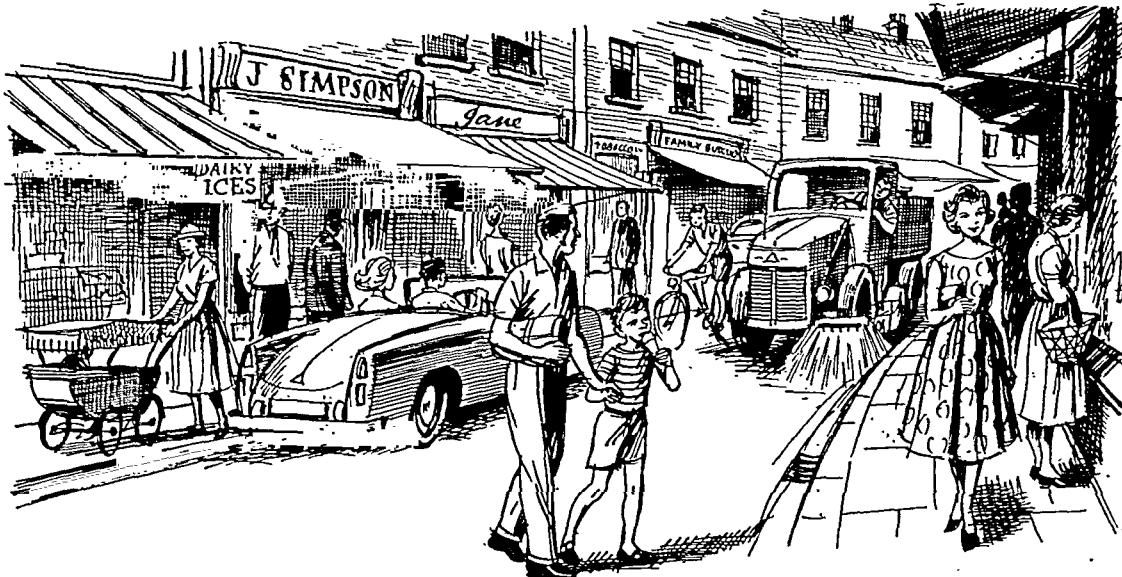
SUMMER

In Summer the days are long. The farmer cuts his hay, and we all want to be in the country, or paddling and swimming at the seaside.

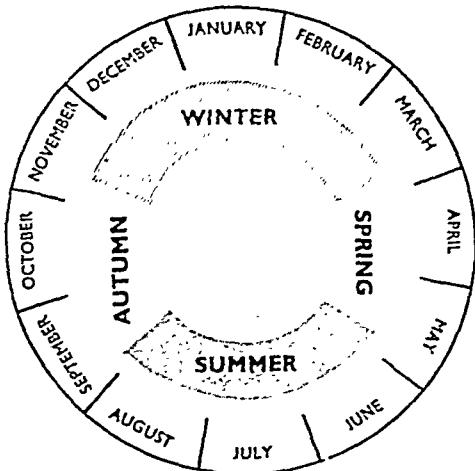


The bees are busy in the gardens, gathering nectar to make honey.

In the towns the shopkeepers pull down their blinds, so that the sun does not fade the brightly coloured hats and dresses in their windows. Everywhere is dry and dusty, and the watercart goes round the streets.

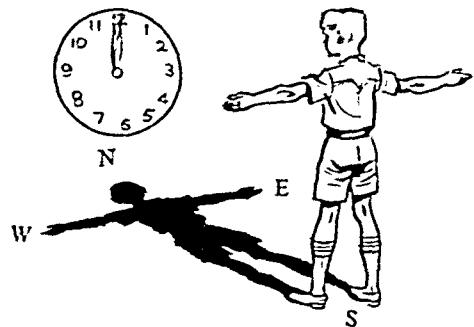


SEASONS AND SHADOWS



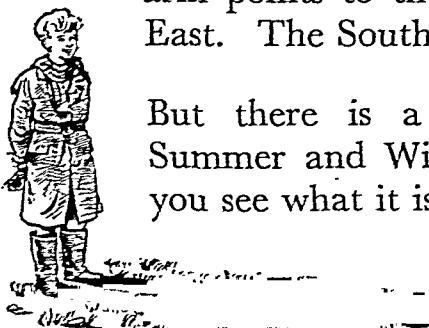
If you want to know where North and South are, at any time of the year, there is an easy way of finding out in the sunshine.

Go out at midday. If you stand with your back to the sun your shadow is pointing North.



If you stretch your arms out sideways, your left arm points to the West, your right arm to the East. The South is behind you.

But there is a difference between Summer and Winter shadows. Can you see what it is?



Winter



Summer

Here is a farm in the middle of Winter.

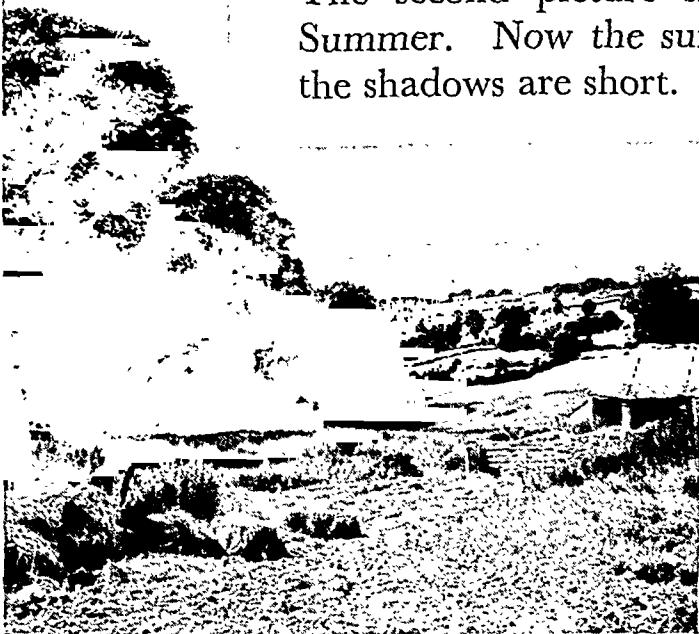
The shadows are long because the sun is low in the sky.

The day is bright and clear, but the sun is too low in the sky to melt the snow.

There are no leaves on the big elm trees.



The second picture shows the same farm in Summer. Now the sun is high in the sky, and the shadows are short.



The warm sun has made the nettles and grass grow tall. Both these pictures were taken at noon, so we can tell by the shadows that the North is to the right. The camera is looking West.

RAIN

You know that rain comes from the clouds. But do you know that the clouds are really made up of millions of very tiny drops of water? If the drops grow bigger they become too heavy to stay in the air, and they fall as rain. If it is very cold, the raindrops turn to snow.



We often think rain is a nuisance, but we could not live without it. We need water to drink, and so do the cows which give us milk and meat.



Cauliflower Peas Apples Grapes Carrots Turnip

Many countries have far more rain than Britain. They have great forests and wide rivers. Some countries have hardly any rain, and no trees or grass can grow there. The people who live in these countries have a very hard life, looking for water, and grass for their animals.

The fruit and vegetables which we eat must have water to make them grow.



PEKO OF THE AMAZON FOREST

The River Amazon is in South America. Hundreds of little rivers flow into it, until it becomes the largest river in the world. Peko lives near one of these little rivers.



The forest around Peko's home is so thick that he can hardly see the sun through the trees, and it is so huge that no one has yet explored it all. Creepers as thick as a man's arm twine round the tree trunks, and great trees hide the sun.

Peko wears hardly any clothes as it is hot and steamy in the forest all the year round. There is no Winter and no Summer, and the trees are always green. In the evening the sun goes down quickly, and suddenly everywhere is dark.

If Peko runs into a tree he may bring down a shower of red ants which will bite him.

When Peko is thirsty he cuts a piece of water vine. He holds it so that the sap runs into his mouth.





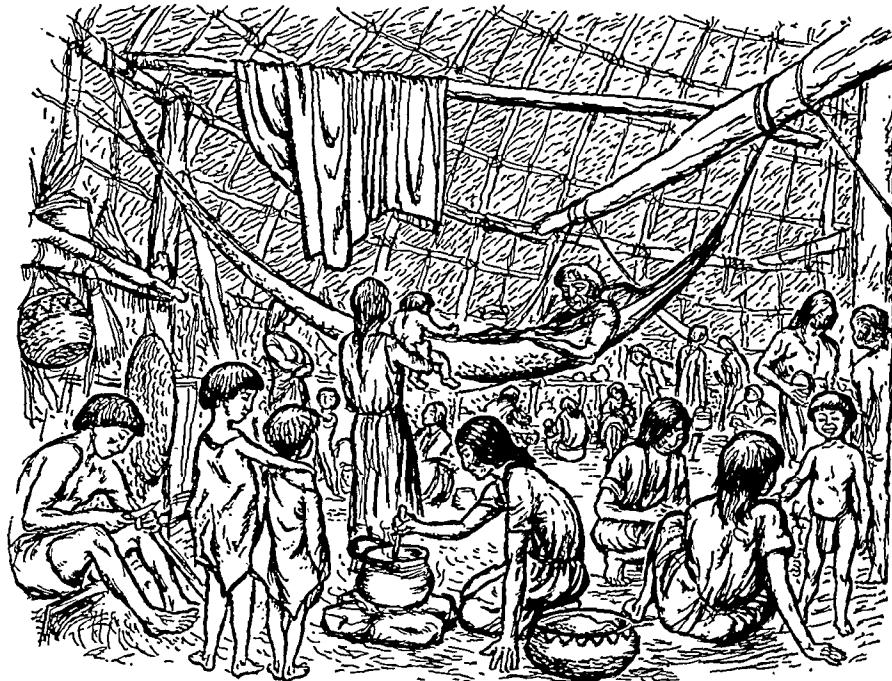
When Peko's father wants to build a new hut he chooses a place not far from the river. But he makes sure that his hut cannot be seen by men coming up the river in boats.

To clear a space, the men of the tribe cut down the trees and creepers with their axes. They leave one tall tree standing, and use it as a centre pole for their new hut. They make a frame of branches round the centre pole, and tie the frame with creepers which are as strong as rope.



They cover the walls and roof of the hut with palm leaves. The doorway is a small opening in the side of the hut. A curtain of leaves hangs over the door.

The hut is dark inside, for it has no windows. The only light comes from the doorway, and from the fires which are always burning.

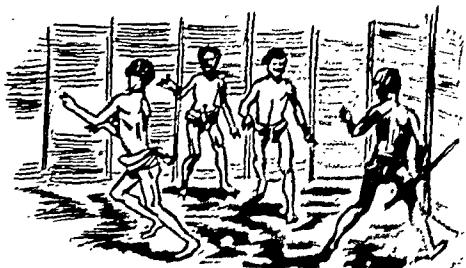


About sixty people live in Peko's hut. They sleep on the floor, or in hammocks made of twisted palm leaves.

Each family has its own fire. There is no chimney, but some of the smoke finds its way out by a small hole in the roof. The smoke helps to keep out the flies and mosquitoes.

The Chief lives on a platform at one side of the hut. In the middle of the hut is a space where the children play.

After two or three years the roof of Peko's hut begins to leak. Then the hut is burned down and Peko and his parents move to another part of the forest, where they build a new hut.



PEKO OF THE AMAZON FOREST



When the men have built Peko's new hut, the ground around it is cleared. Then Peko's mother and the other women can grow sugar cane, maize, and *cassava*, which is a kind of vegetable root. Peko's mother collects the large roots of the cassava in a basket on her back.

The roots of the cassava are poisonous, but she peels and grates them and soaks them in water to get rid of the poison. Then she drains them and bakes flat cakes over the fire.

Peko's mother collects nuts from the trees in the forest. She cuts the bark of the rubber trees, and collects the juice which runs from them.



She goes to the river and with the clay which she finds there she makes pots. She also makes baskets from palm leaves.

Peko's mother does not wear many clothes, but she likes to make herself beautiful. She paints patterns on her face and body with a red dye. She wears a necklace made from the teeth of a jaguar.

Peko's father and the men of the tribe are hunters. They shoot poisoned arrows from long blow-pipes and kill the animals and birds of the forest. There are no very large animals in the forest, for it is too thick for them to move about freely.

At night black tapirs come out to find food. The cries of the jaguar echo through the forest.

Peko is too young to go hunting. But even from the door of his hut he can see monkeys swinging by their tails from the trees.

Peko sees brightly coloured parrots and toucans flying above him. In the bushes there are large hairy spiders. They are so large that they can catch small birds in their webs and kill them.

Peko has to be careful of the poisonous snakes on the ground, or he may be bitten.



A parrot and a toucan



A monkey



A tapir and a jaguar

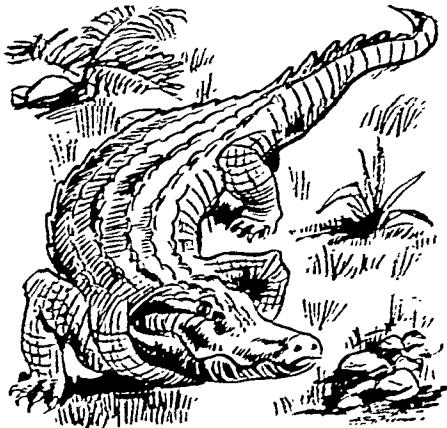


A spider killing a bird

PEKO OF THE AMAZON FOREST

There are no roads in the forest, but there are many rivers because there is so much rain.

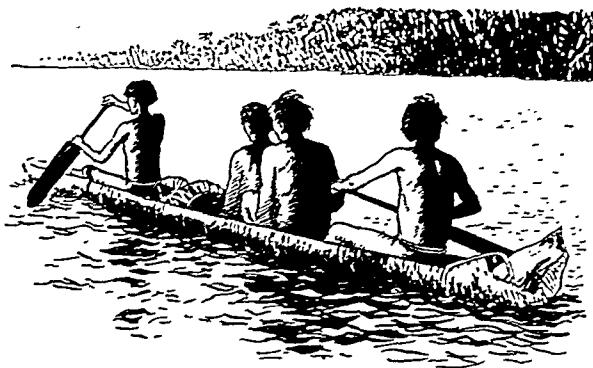
The forest is so thick that the only way to travel far is by a river.



An alligator

Peko sees alligators basking in the sun on the banks, or sliding into the water.

Few people ever come into the forest, but sometimes traders come up the river. The men and women of Peko's tribe give nuts and rubber to the traders, and the traders give them knives and cloth.



Peko's father has a large canoe which he hollowed out of a tree trunk. It is very strong, and it takes three men to carry it from the hut to the river.

Sometimes Peko goes fishing with his father. They spear turtles and fish, and take them home to be cooked. Peko must be careful, for some of the fish can bite, and there are needle fish with sharp points.

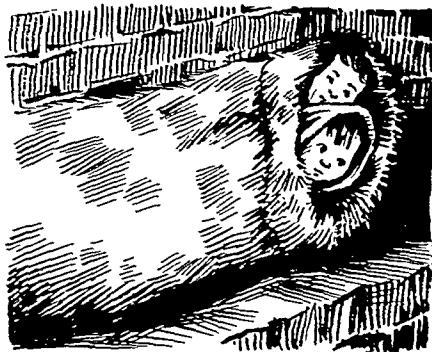


Kara sleeps on a snow platform covered with furs. She shares a big sleeping bag with her baby brother.



A seal-oil lamp

Two seal-oil lamps, with wicks made of moss, give light and heat. But Kara's father does not let the air get too warm, or the walls of the house may begin to melt.



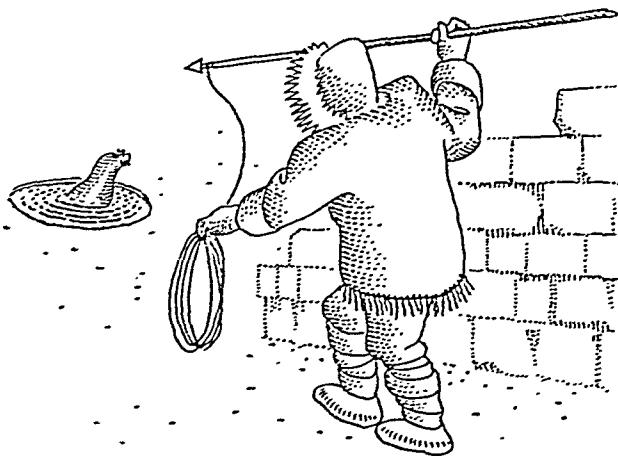
Sometimes in the Winter there is not enough food stored in the igloo for Kara and her family. So her father sets off to hunt for seals. He goes on his sledge, pulled by a team of dogs. If he is away from home for more than a day, Kara's father builds himself a small igloo to sleep in.

The sledge is strongly made of wood, and the runners are covered in frozen mud, so that they will slide easily.

The dogs are strong and fierce, but Kara's father controls them with shouts and with his whip.



KARA OF GREENLAND



On the ice Kara's father looks for the breathing-holes of the seals. Then he builds a wind-shelter from blocks of snow, and settles down to wait. He waits for a long time until the seal comes up to breathe. Kara's father drives his harpoon into it.

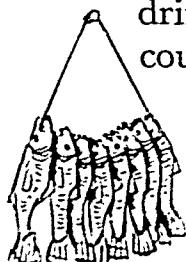
The harpoon is tied to his wrist with a long seal-skin rope, and he often has a hard battle before he can pull the seal on to the ice.



A harpoon

The dogs drag the seal home. Kara's father skins the seal. Her mother uses the skin to make tents, ropes and coats. She saves some of the skin for making boats.

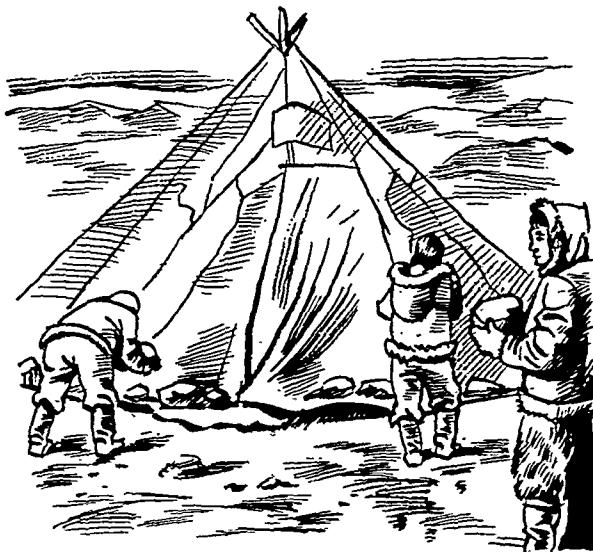
Under the seal's skin is a layer of fat, called blubber. Eskimos eat a great deal of raw blubber to keep themselves warm. They like to drink the warm blood of a seal, because in their country they have no milk.



Kara's father sometimes catches fish. Her mother salts them and hangs them to dry on a sealskin string.

At the end of the Winter the igloo begins to melt. Soon the rocky ground shows through the snow, and for a short time the ground is covered with a carpet of tiny flowers.

Then Kara's father sets up the Summer tent. It is called a *toupig*, and is made of sealskin stretched over wooden poles.

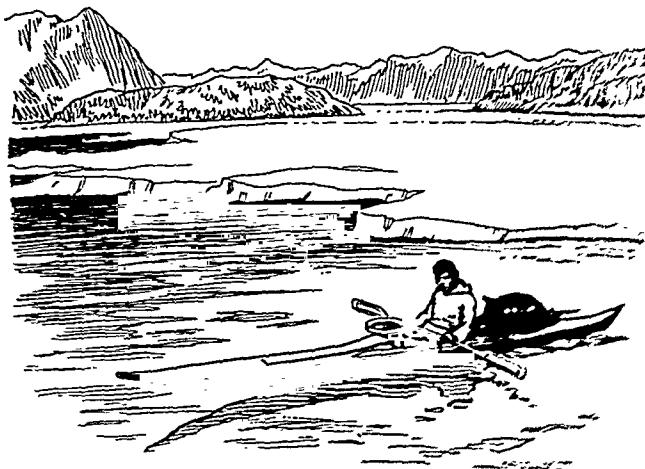


When the ice along the shore begins to break up, Kara's family go hunting for seals and walrus. The men set off in their light boats, called *kayaks*. The kayaks have wooden frames and the sides and top are covered with sealskin. When an Eskimo is sitting in his kayak he straps himself in tightly, so that no water can get inside the kayak.

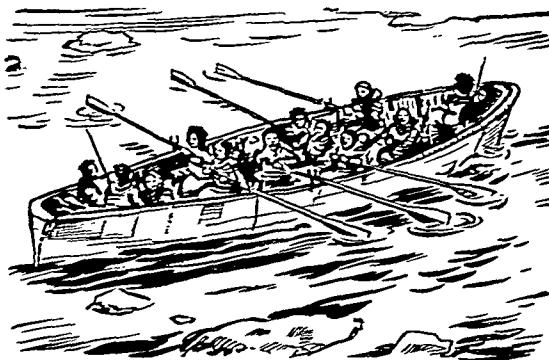


A walrus

A kayak is very difficult to paddle, but Kara's father is so clever that he can turn his kayak over and come up again, still strapped in.



KARA OF GREENLAND



After the day's hunting, the Eskimos set up their toupigs. They enjoy the fish they have caught and the bilberries which the children have found. The women scrape the flesh from the seal skins.

Later they take some of the skins to the trading station to sell them. With the money they buy food and rifles.

When the men set off in their kayaks, all the women and children follow in their boat. It is called an *umiak*. The *umiak* is made like a kayak, but is much stronger. Kara's mother helps to paddle it.



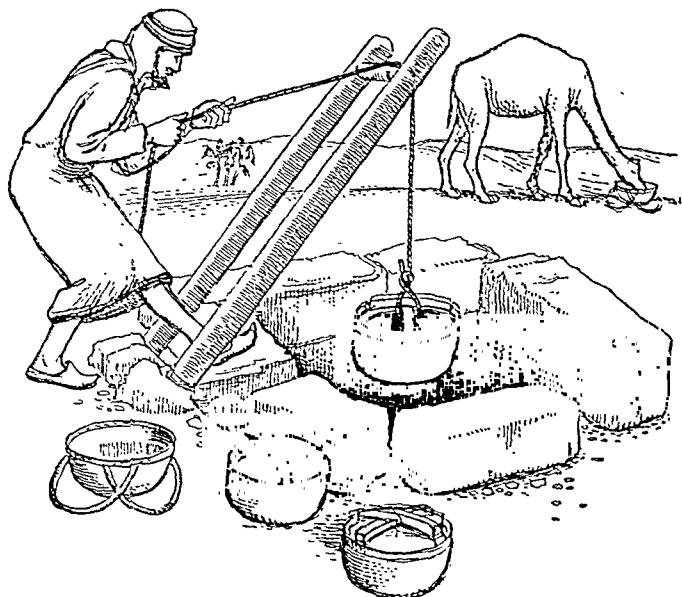
At the trading station there are Eskimos who live in stone and wooden huts.

These Eskimos have stoves to keep them warm, and some of them even have radios.

NASIR OF ARABIA

Nasir lives in Arabia, which is a hot, dry country where it hardly ever rains. Most of Arabia is desert, with sand, rocks and prickly bushes.

The people of Nasir's tribe are Bedouin Arabs. They do not stay in one place, but move about the desert in search of grass and water for their sheep, goats and camels.



*A bucket
and a bag*

Sometimes the Bedouins find a place where there is water and where a few trees grow. It is called an *oasis*.

At the oasis Nasir's father draws water from a well. The animals drink some of the water from a trough. Nasir's father stores the rest in bags made of goat skin. His buckets are made of camel skin.

Water is very scarce, so an Arab never wastes any. Sometimes he even washes his face in sand, to save his water for drinking.



NASIR OF ARABIA



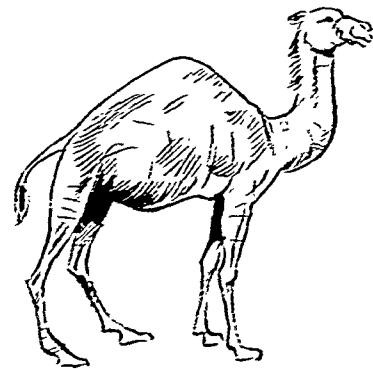
Because Arabia is a hot country, Nasir wears clothes which helps to keep him cool.

He has a white smock with wide sleeves, and a long blue cotton cloak over it. On his head is a dark blue cloth which keeps off the sun. It is held in place by a rope made of camel hair.

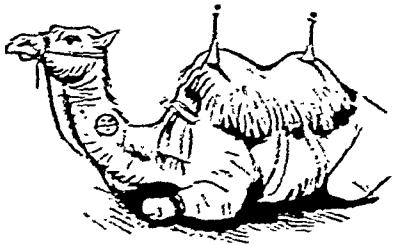
Nasir rides on a camel. The camels are very well suited to the desert. They have large feet and they can walk easily on the soft sand.

Their humps are stores of fat. They can live on this fat for many days, even if they have no water to drink.

The skin of a dead camel is made into bags and buckets, and its meat is good to eat.



Nasir's father guards his camels carefully from raiding Arabs. He brands their necks so that he knows which are his. At night he ties their front legs, so that they cannot move.



The Chief of Nasir's tribe rides an Arab horse, which is very fast and strong. The Bedouins are very proud of their famous horses, and Nasir, like every Arab boy, hopes to have his own horse one day.

As the Bedouins journey across the desert, all their tents and baggage are carried on the camels' backs. The shepherds go ahead to look for grass and water. When they have found grass for the animals to eat, one of them rides to tell the Chief. He leads the rest of the tribe, and tells them where to pitch the tents.

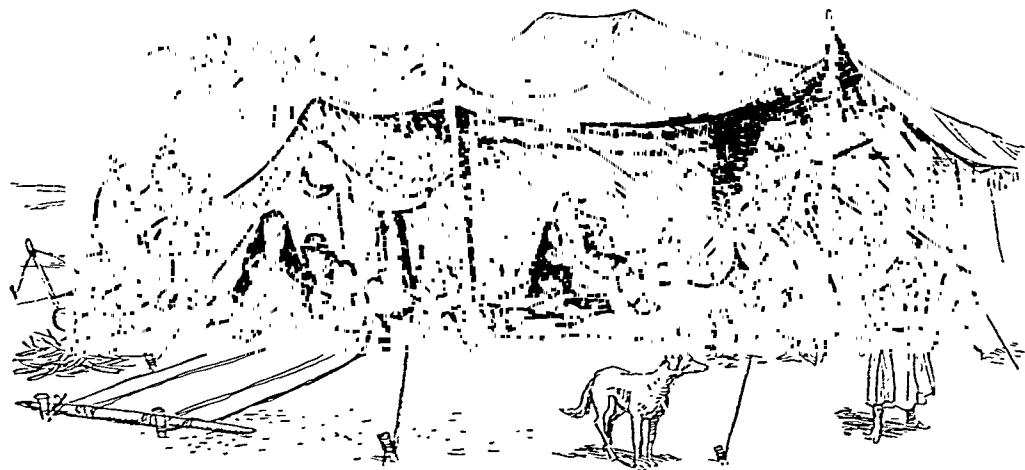


The baggage is unloaded from the camels, and Nasir's mother and the other women unroll the tents. They put tent poles under the roof, and fasten the side curtains to keep out the wind.



Nasir helps to drive the tent pegs into the ground, and to pull on the ropes which hold up the tent. He lays the carpets inside the tent, and then their home is ready.

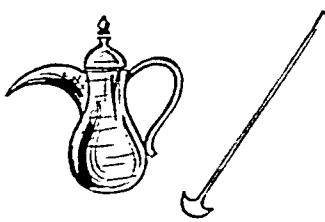
Nasir's tent is made of black goat hair. It is pitched with its back towards the wind. But when the wind changes, the women quickly close one side of the tent and open the other, so that the sand does not blow in.



On one side of the tent is the kitchen, and the place where the women live and sleep. Nasir's baby sister sleeps here in a cradle.

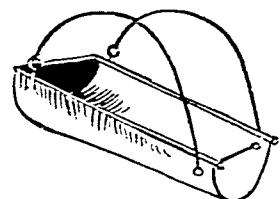
There are cooking pots on the floor, and bags of rice and salt. Just outside the women's side of the tent are the water buckets, and a store of wood for the fire.

Nasir lives on the other side of the curtain with his father and the men of the tribe. Here are the saddles and rifles, the fire and the copper coffee-pots.



A coffee-pot and stirrer

Any stranger who calls is sure of a welcome and a drink of coffee. No visitor, even if he belongs to an enemy tribe, will be harmed while he is a guest.



A cradle



During the day, Nasir's mother has many jobs to do. She spins sheep's wool and camel hair into long threads. With the threads she makes clothes and repairs the tent. She milks the camels and goats, and makes butter-milk, called *leben*.

The Bedouin Arabs have very simple food. Usually they live only on camel's milk, cheese and a few dates. For a feast they roast locusts, or kill and cook a camel or a sheep. They also eat boiled rice and leben.



All the men sit cross-legged on the floor and help themselves from the great dishes.



Nasir uses his right hand to eat. He picks up some food, rolls it into a ball, and puts it in his mouth.

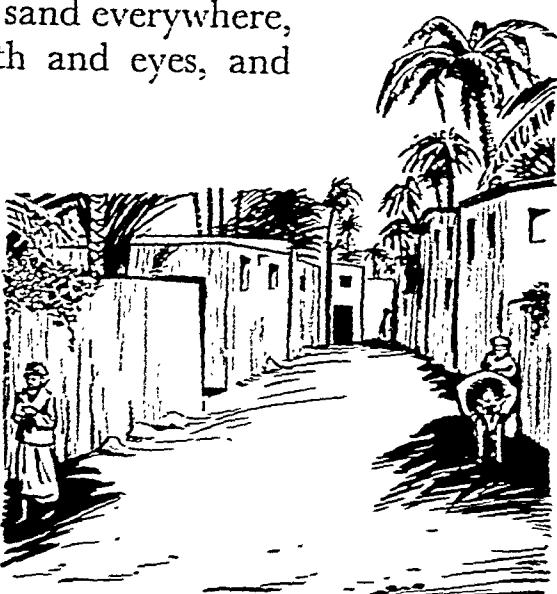
After the meal, Nasir and the other boys play a game with tent pegs, or they throw stones with their slings.

NASIR OF ARABIA

In Summer the grass dries and even the winds are terribly hot. Often the wind blows so hard that it makes a sandstorm, and clouds of sand blow everywhere. Nasir curls up in his cloak. The camels lie down and close their nostrils.

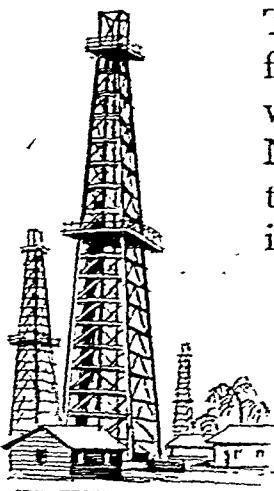
When the storm is over, there is sand everywhere, in Nasir's clothes, in his mouth and eyes, and even in his food.

In the Summer it is far too hot for Nasir to stay in the desert, so he and his family camp near an oasis. Here there is a well with water for the animals. The people who live at the oasis have a few date and pomegranate trees, and small fields of maize.



They draw water from the wells to water the fields. They live in houses made of baked mud, with flat roofs and small doors and windows.

Nasir is glad when the dry Summer is over, and the Autumn rains come. Then he goes back into the desert with his family and the animals.



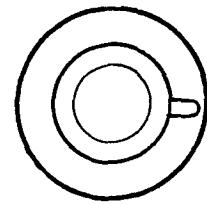
In parts of the desert, oil wells have been drilled. This has made some Arab chiefs very rich. They have splendid palaces, and they have built hospitals and schools for their people.

HOW TO DRAW PLANS

Here is a picture of a cup and saucer.



Here is a plan of them. The plan shows how they look from above. Can you see the handle of the cup?

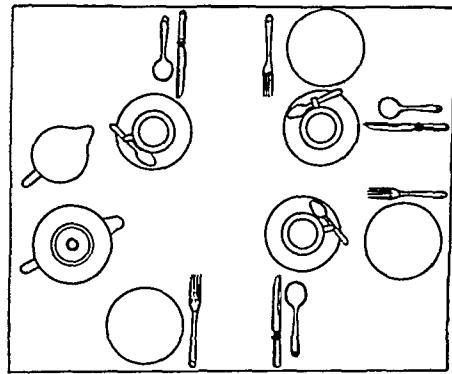


Try to draw a plan of this jug.

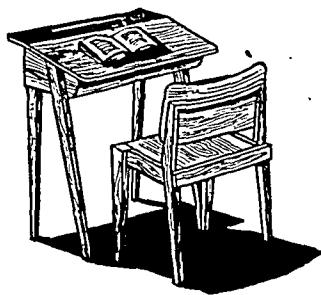
Here is a plan of a table laid for breakfast.

How many cups and saucers are there?

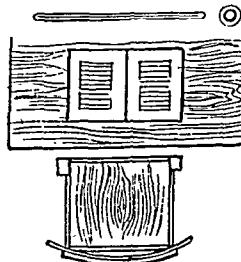
Where is the teapot?



Here is a picture of a desk and chair.



Here are the desk and chair as they look from above. Can you see the book and the inkwell?



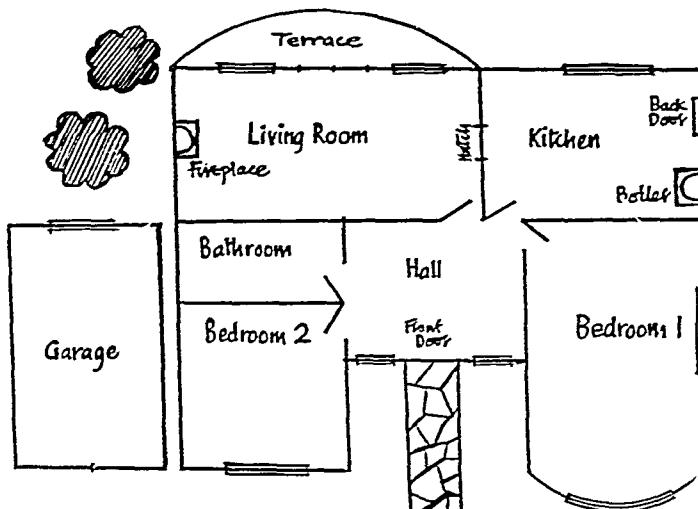
HOW TO DRAW PLANS

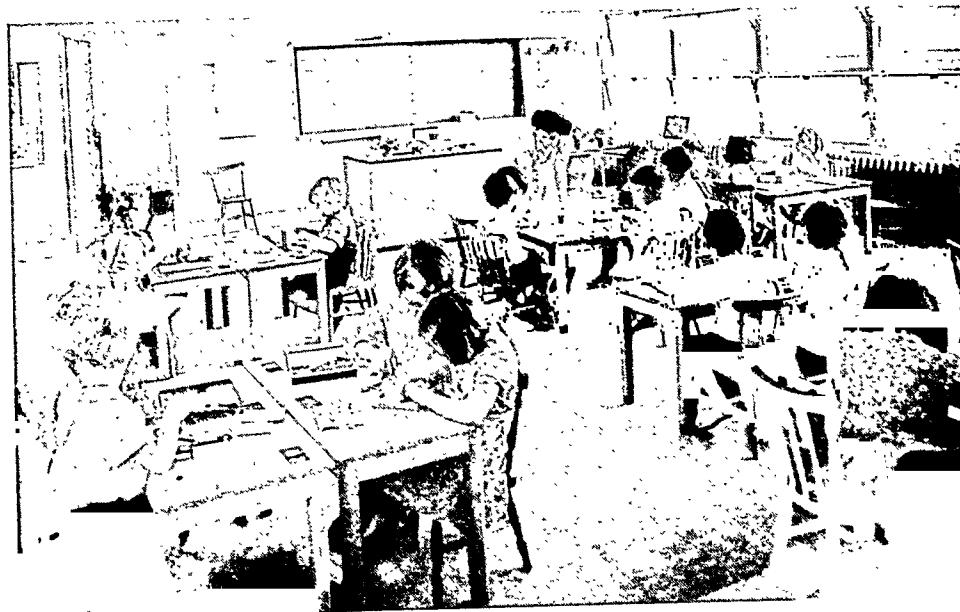
Here is Ann's house. It has no up-stairs, and it is called a bungalow.



Here is a plan of the bungalow. The builder used a plan like this when he built the house.

How many bedrooms are there? How many rooms have doors which open on to the hall?





Here is a picture of part of a classroom. The plan below shows the whole classroom. Look at the plan. Part of it is drawn darker than the rest, and it is cut off by dotted lines. That is the part which is shown in the picture.

KEY

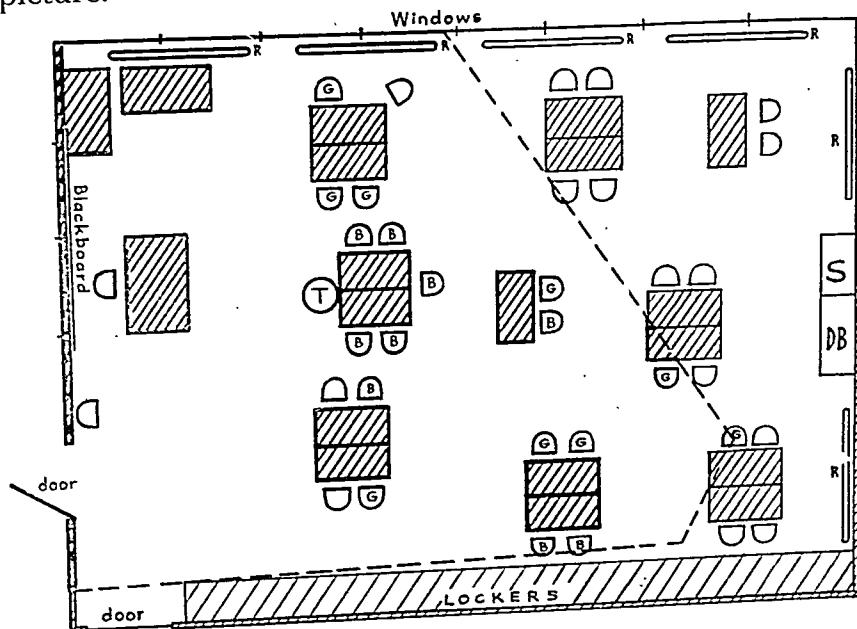
- B Boy
- DB Draining Board
- G Girl
- R Radiator
- S Sink
- T Teacher

The classroom is 32 feet long and 24 feet wide.

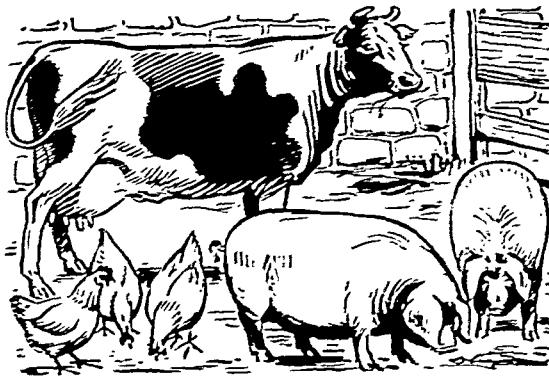
How many boys and how many girls are there? Where is the teacher standing?

Draw a plan of your classroom, and show which is your desk.

L.W.—4

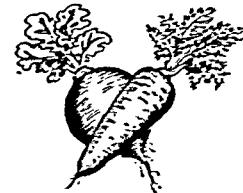


DAVID OF GREAT BRITAIN

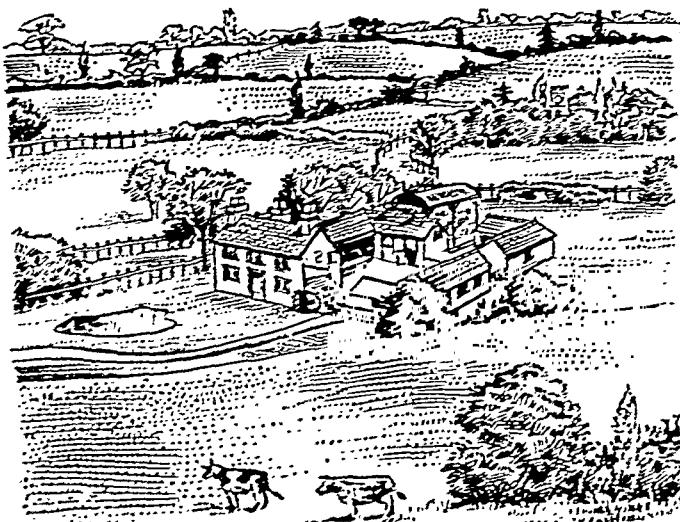


David is the son of a farmer. He lives on a farm in the North of England. Because his father keeps animals, and grows crops as well, the farm is called a "mixed" farm. David's father keeps cows, pigs, sheep, and hens, and he grows wheat and "roots", such as turnips and swedes.

"Roots" are used to feed the cows and sheep in winter. David's father also grows potatoes to sell.



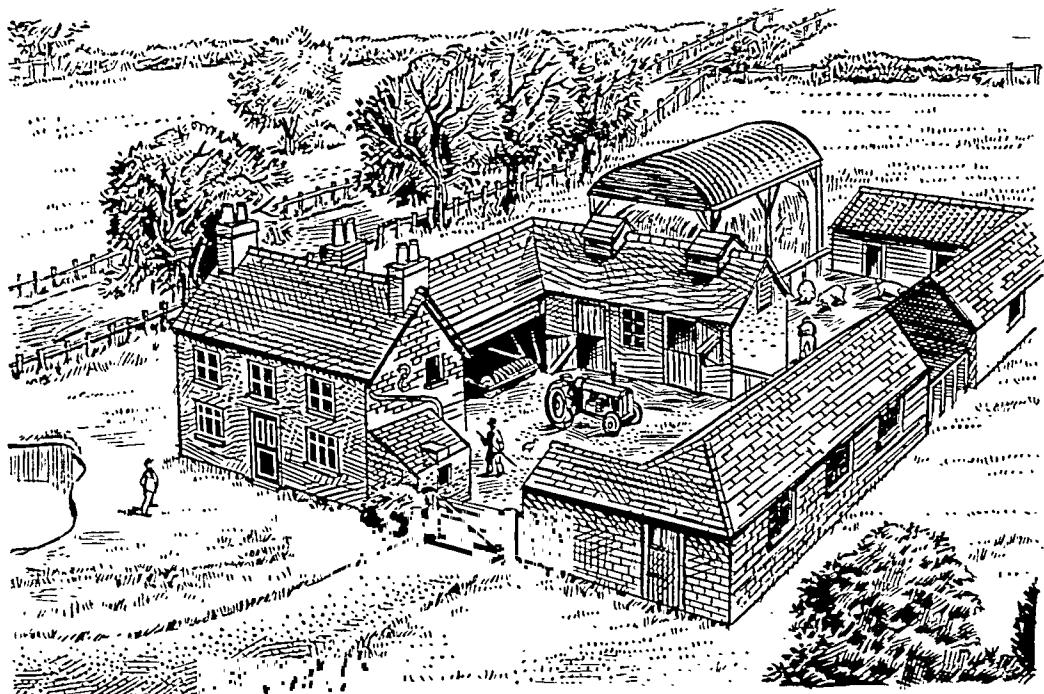
A turnip and a carrot



Here is David's farm seen from the hills nearby.

Not far from the farm is the village with a small shop and a Post Office.

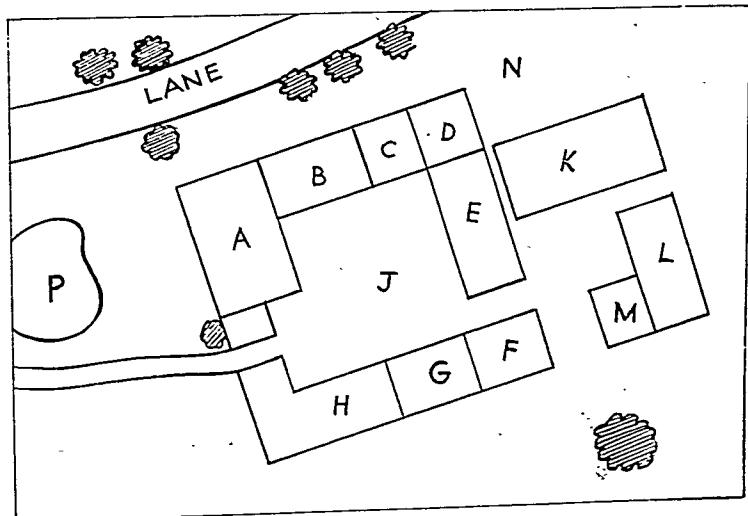
Can you see the church?

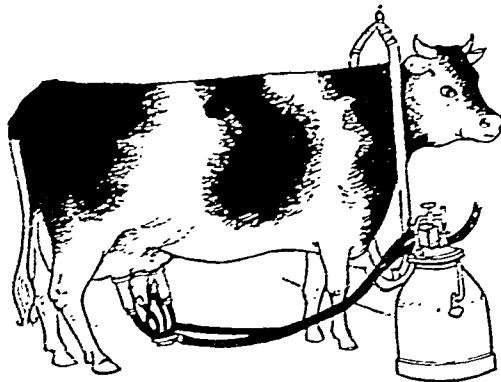


Here is David's farm again. Find out what happens in each part of the farm, by looking at the plan below.

KEY

- A Farm-house
- B Stockman's House
- C Toolshed
- D Granary
- E Stable and Calf House
- F Tractor Shed
- G Dairy
- H Cowshed
- J Straw Yard
- K Hay Barn
- L Pigsty
- M Store Shed
- N Stack Yard
- P Pond



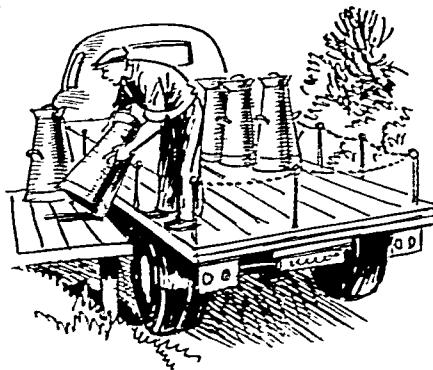


There is always plenty of work on a farm, on every single day of the year.

Each morning at about six o'clock, and again at four o'clock in the afternoon, the cows are milked. After the milking the cowman cleans the milking machine, the cooler and the churns.

Then he washes out the milking shed, and the churns of milk are taken by a lorry to the town.

David has his breakfast at seven o'clock. He has porridge, eggs and bacon, for there is always plenty to eat on a farm.



One of David's jobs during the holidays is to collect the eggs. He also helps to feed the pigs, the horse and the hens.

In the old days there were many horses on the farm. But now David's father has a tractor to pull his machines and carts, and he can do his work much more quickly.

Let us spend a day with David in each season of the year.

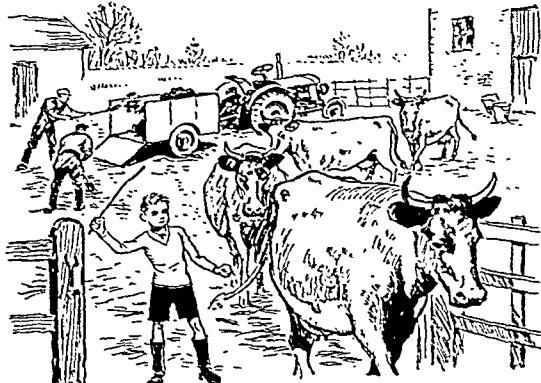
SPRING

In Spring the fields and hedges become green. The lambs which were born in January are now much stronger.

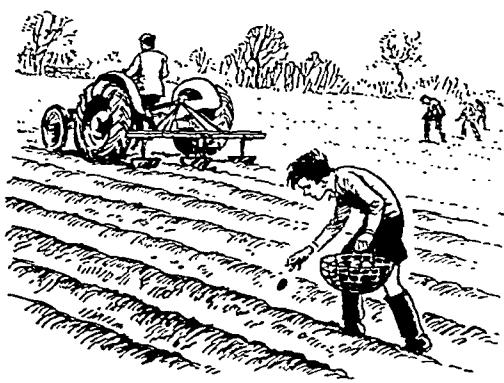
David drives the cows to the meadow. They have spent the coldest part of the Winter in the farmyard and they enjoy eating the fresh green grass.



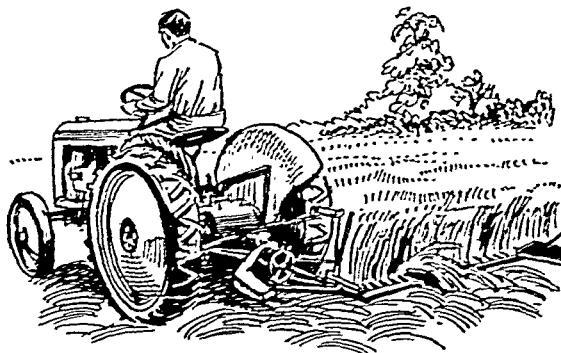
Later David helps to sow the potatoes. First, the tractor furrows the field. Then David walks down the rows dropping a seed potato in every fifteen inches. The tractor covers them, and in a few weeks dark green leaves are sprouting through the soil.



Driving the cows to the meadow



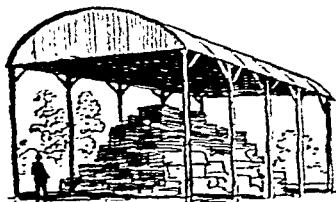
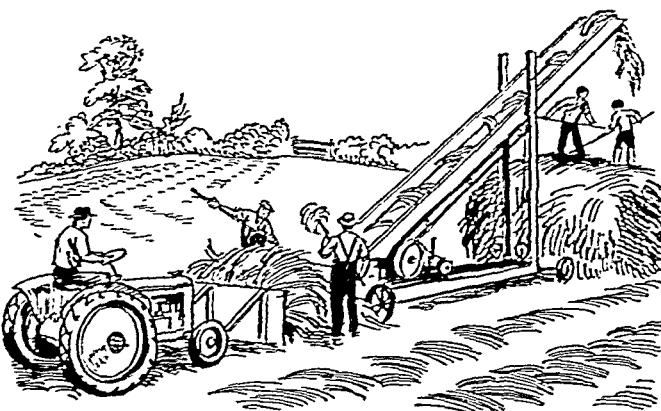
Planting potatoes

*A mowing machine*

Haymaking is one of the most important jobs in Summer. The grass is cut on a fine day, when it is about two feet tall. A mowing machine cuts it close to the ground. The grass is left for several days to dry. When it is quite dry it is called hay.

A tractor is used to collect the hay, and to push it to an elevator. The hay is forked on to the elevator, which lifts it on to the stack.

The hay is stacked near the farmyard, so that it is near at hand in the cold weather. Some of it goes into Dutch barns, but most of the hay is stacked outside, and thatched to keep out the rain.

*A dutch barn*

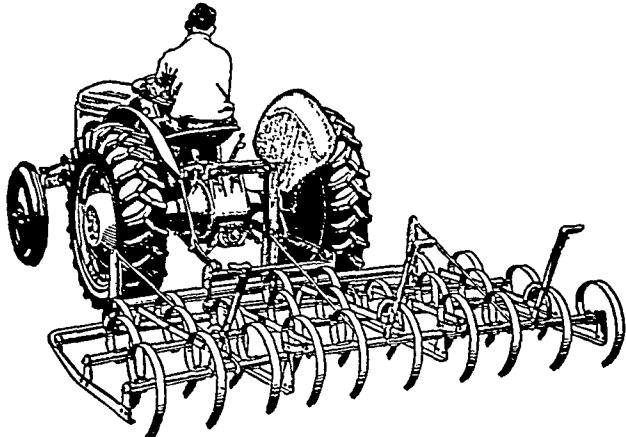
Then in the Winter, when the grass does not grow, the cows have plenty of hay to eat. David's father also gives them cattle cake, made from the seeds of cotton plants.

*A haystack*

AUTUMN

Wheat

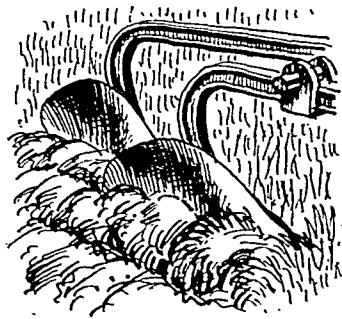
In the Autumn the wheat is harvested. Later on, next year's wheat is sown. The plough turns over the soil, and the harrow breaks it up. Then the tractor pulls the seed drill, and the seed goes down the spouts and into the soil.



A harrow

In another field the tractor and spinner spin out the potatoes. David goes down the rows picking up the potatoes and popping them into his sack.

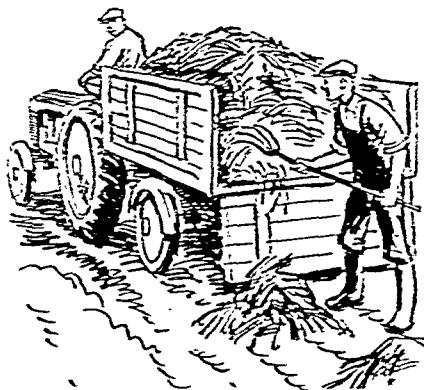
A cart collects the sacks, and then David's father sends the potatoes to be sold at the market.



A plough

Ten days later the first green shoots appear. They do not grow very much during the Winter. But when Spring comes again, the wheat is strong, and has plenty of time to grow and to ripen.





Spreading manure

The hedges are trimmed in the Winter, and every few years they are "laid", which makes them very thick and strong. Before the wet weather comes, the ditches are cleared out so that the heavy rain can run off the land and flow away easily.

WINTER

There are no idle days on a farm, even in Winter. When the ground is frozen hard, that is the best time to take a tractor and cart over the fields spreading manure. As the tractor moves along, small heaps of manure are pulled off the cart with a fork.

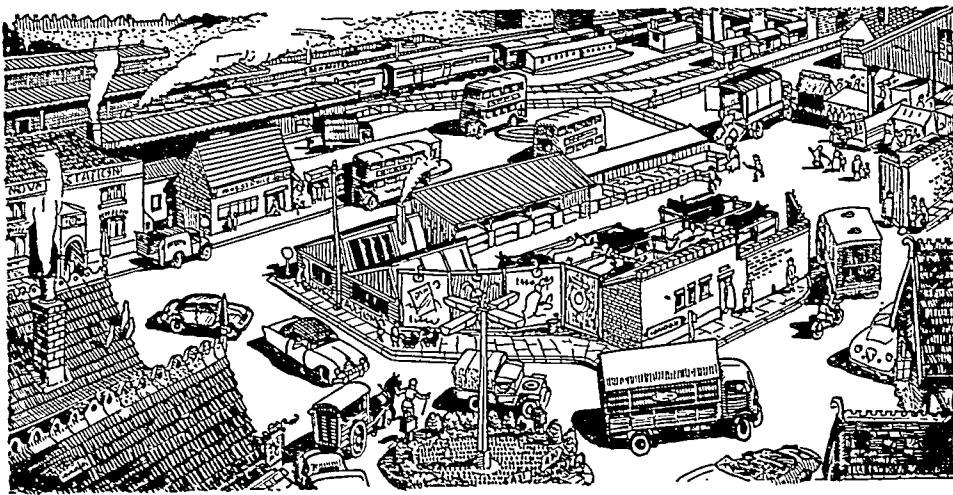


"Laying" a hedge



Feeding a lamb from a bottle

Winter is the time when the lambs are born. The shepherd builds a lambing pen with hurdles and straw, to protect the lambs from the wind. He covers the ground with straw so that the lambs will be warm. The shepherd lives in a hut near the pen. The mother sheep are called *ewes*. They are fed on turnips and hay. The lambs take milk from the ewes, but if a ewe dies the shepherd feeds her lamb from a bottle.



David enjoys going to the market with his father. Early in the morning they load the young cows, called heifers, into the cattle truck, and take them into town.

The heifers are driven into the ring and sold by auction to the farmer who offers the most money.

Near the ring are the pens where the pigs and sheep are sold.

The town is very crowded on market day. People come in by bus from all the nearby villages.





At the market David's father likes to look at the new machines. Here he is looking at a small caterpillar tractor. He does not need the big machines often, so he hires them in the town.

In one part of the market, farm produce is sold. David's mother brings in eggs and chickens to sell. The market sells everything: cloth, buckets, pans, clothes, vegetables and fruit.



CHAI OF CHINA

In a small village in China lives a little boy called Chai. Chai's Winter clothes are padded, so he looks as if he is dressed in a suit made from a quilt.

Most of the trees in China were cut down many years ago, so there is hardly any wood to build houses. Chai's house has a bamboo frame. Bamboo is a tall, strong plant which is used for making rafts, sails for boats, houses, tiles and ropes.

The bamboo is tied together to make the walls, then it is covered with mud. When this has been baked by the sun it makes a good wall. A tile roof keeps out the rain.



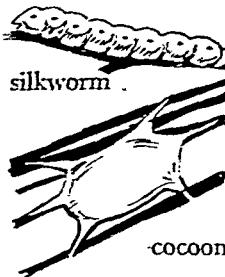
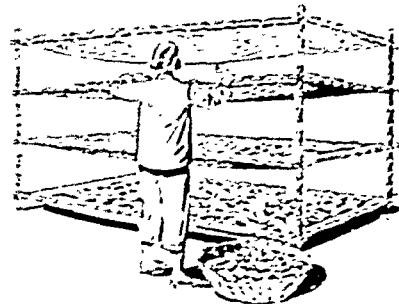
There are only three rooms in the house and they are very crowded. Outside in the courtyard Chai's father sifts the rice which he grows. His water-buffalo, his pigs and hens and his donkey live in the yard.



CHAI OF CHINA

Chai's sisters keep silkworms on trays in the living-room. Each worm eats twice its own weight of mulberry leaves every day.

The silkworm spins a fine thread round and round itself until it has made a *cocoon*.



Then Chai's mother kills the worm in boiling water, and unwinds the silk thread. (If she did not kill the worm it would change into a moth and break the threads.) From each cocoon she gets nearly *half a mile* of silk thread. She sells the silk to a merchant in the town.

Chai's mother also prepares the dinner, which is nearly always rice. The rice is boiled in a big iron pot, with beans and bamboo shoots. Sometimes Chai also has fish, or an egg.



Chai sits on the floor to eat his food from a bowl. He does not have a knife and fork, but uses chopsticks, which are short sticks made of bamboo.

Chai's father has a few small fields near the river, where he grows rice. To grow well rice needs water round its roots, so there are ditches full of water by all the fields. Chai's father pedals at a treadmill to lift water from the river into the ditches.

Chai helps his father to sow the rice in the seed beds. When the seeds begin to grow, a hole is made in the wall of the ditch so that water runs all over the beds. Then the hot sun and rich soil help the seeds to grow quickly.



Next, their water-buffalo pulls a heavy plough across another flooded field ; this makes it ready for the little seedlings which are now about eight inches high.



Chai and his family pull the seedlings out of the seed bed and plant them out in the flooded field. They push them into the mud under the water, so that only their tops are showing.



Cutting rice



Threshing rice

If the rice fields are very dry, Chai's father lets water from the ditch run on to the fields. If there has been rain he drains some water away, so that the top of the rice is out of the water. When the rice begins to ripen he drains all the water away. Chai uses a sickle to cut the rice.

Then his father threshes the rice by beating it against a big box. The grain falls to the bottom of the box. The straw is saved for the roofs of houses, and for making hats.



Rice

The rice does not take very long to grow, and Chai's father can grow two crops every Summer. In the Winter he grows wheat, beans and barley.

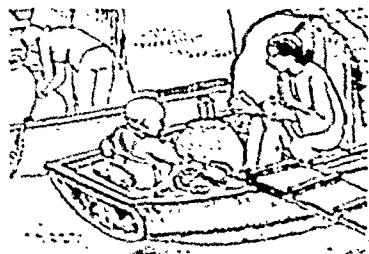


Sometimes Chai's brothers carry a live pig to market on a pole. Chai's father has only his family to help him on his small farm. Some farmers nearby have joined all their farms together, to make one large farm. They have bought a tractor, but Chai's father cannot afford one for his farm.

Chai likes to walk down the muddy road to the Yangtse river, one of the biggest and busiest rivers in the world. The river is covered with flat-bottomed boats, called sampans.

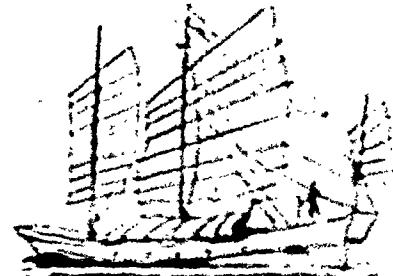
Many people live all their lives in these boats, and they hardly ever set foot on land.

They keep birds called cormorants which catch fish for them. The birds have rings on their necks, so that they cannot swallow the fish which they catch.



The young children who live on the boats have pieces of bamboo tied to their backs. If they fall in the river, they float!

Chai sometimes goes on the sampans, and one day he hopes to go on the big junks. These boats have square bamboo sails. They carry large cargoes of rice down the river and along the coast, to the great ports of China.



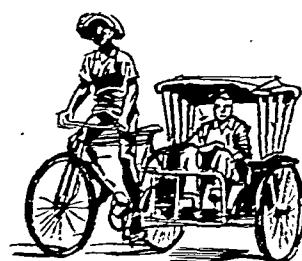
A junk

CHAI OF CHINA



Sometimes Chai goes to the town with his father. In the old part of the town the streets are narrow and crowded. They have shops on both sides. The shopkeepers put all their goods on benches outside their shops. Water carriers carry pails of water on long poles, and one shop even sells boiling water.

*The old
part of
a Chinese
town*



A rickshaw

Here is a man riding in a bicycle rickshaw. The streets are full of rickshaws, cars and carts.



In the new part of the town there are fine new shops and flats. Chai sees modern buses, cars, and large factories.

One day China will be a rich country, for plenty of coal and iron have been found in the North. Factories are being built, as well as roads, railways and new houses. But Chai's country is so big that the work will take many years.

SIGRID OF NORWAY

Sigrid is gliding over the snow on her way to school. The long thin pieces of wood on her feet are called skis.

Sigrid lives in Norway. Norway has so many mountains that there is little good land for farming. In Winter it is very cold, and even in Summer the tops of the mountains have snow on them.



In the mountains, the snow is packed so tightly that it becomes a solid river of ice, called a *glacier*.

The glacier moves very, very slowly down the valley until it melts and becomes a sparkling stream.

The stream runs on, tumbling over the rocks, until it falls down the mountain side as a waterfall.

A glacier

Sigrid's farmhouse is near the foot of a waterfall. The waterfall drives the electric motor which lights the house and drives the saw which cuts up the trees. Then the stream flows through the fields into a long narrow valley which has been filled by the sea. This valley is a *fiord*. There are many fiords on the coast of Norway.

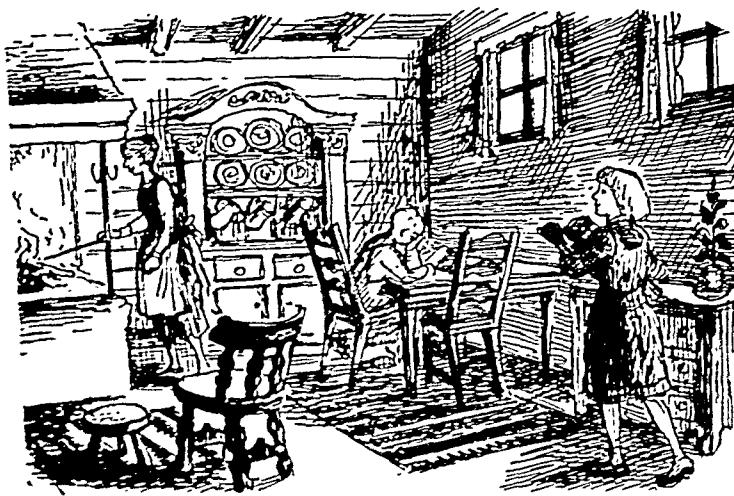


Ocean liners in a fiord



The cows and goats spend the Winter in the barns, and the lofts above the barns are full of hay. The horse has to climb up a slope to reach the loft.

In the storehouse nearby, oatmeal, potatoes, salted fish and cheese are kept.

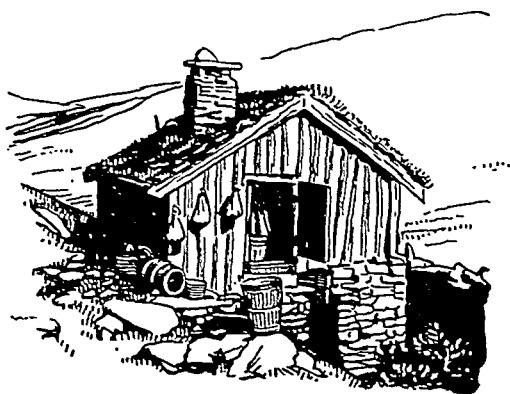


Sigrid's house is built on a layer of stones so that it is always dry. The walls of the house are made of timber. The roof is made of turf and birch bark, and it slopes steeply so that in Winter the snow slides off it.

One of Sigrid's jobs is to bring logs for the fire. Her father made the heavy wooden furniture, and her mother wove the gaily coloured rugs.

Pine trees grow on the mountain sides. Higher up the mountain the soil is not deep enough for trees, and only grass will grow.

In Winter the grass is covered with snow.



A saeter hut

Each night and morning Sigrid helps to milk the cows and goats. The cans of milk, butter and cheese are sent to the farm on a long wire which runs down to the valley.

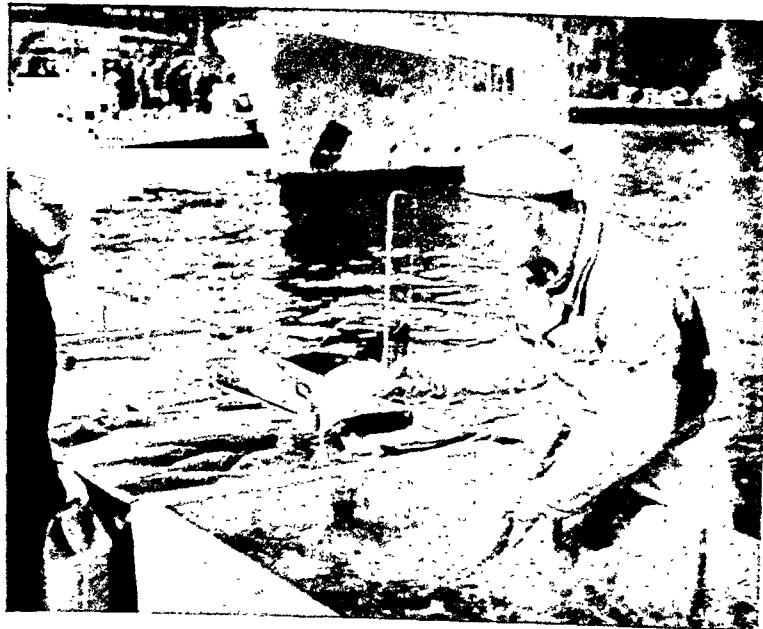
Then the butter and cheese are sent to the market town at the end of the fiord.

In the valley Sigrid's father cuts the long green grass. He dries it on poles, for it rains too often to leave it on the ground. He needs plenty of hay to feed his animals during the Winter.



In Summer these high pastures, called *saeters*, are fresh and green, and the cows and goats are taken there to graze. For the whole of the Summer Sigrid and her brother and her mother live in a hut on the saeter. They look after the animals.





Here is a man selling live fish in Bergen, the fishing port. Some fish are frozen and sent to England. Others are salted and packed in barrels for the Russians, or tinned or smoked for the Americans.

Some men near Sigrid's home are foresters. They cut down pine trees in the great forests on the mountain slopes. Then the logs are floated down the rivers to the saw mills.



The logs are cut into planks for building houses, or making furniture or making shallow fish-boxes. Paper is also made from wood, and the paper of this book is probably made from a tree which grew in Norway.

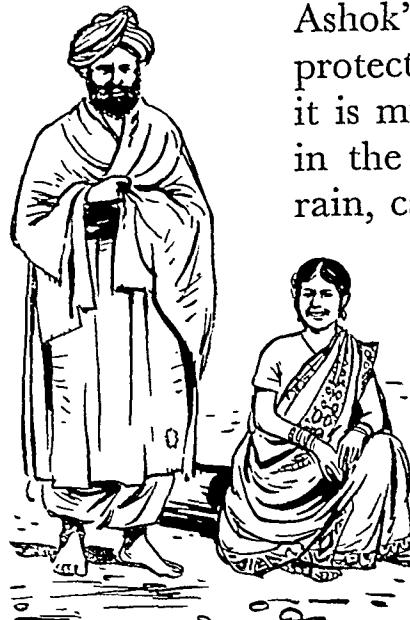
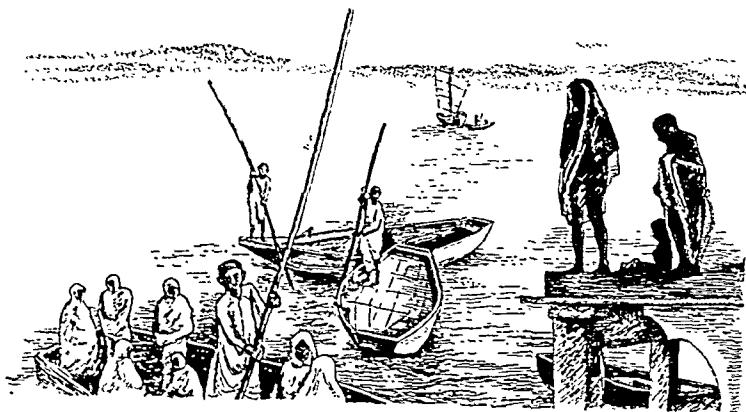
There are also many fishermen near Sigrid's home. They fish in the fiord and in the open sea. Two or three boats go together, towing nets between them. The catch cod, herring and plaice.



A power-driven saw

ASHOK OF INDIA

The River Ganges is a great river. It flows from the Himalaya mountains down to the Indian Ocean. Millions of people live near the river. One of them is Ashok, a little Indian boy.

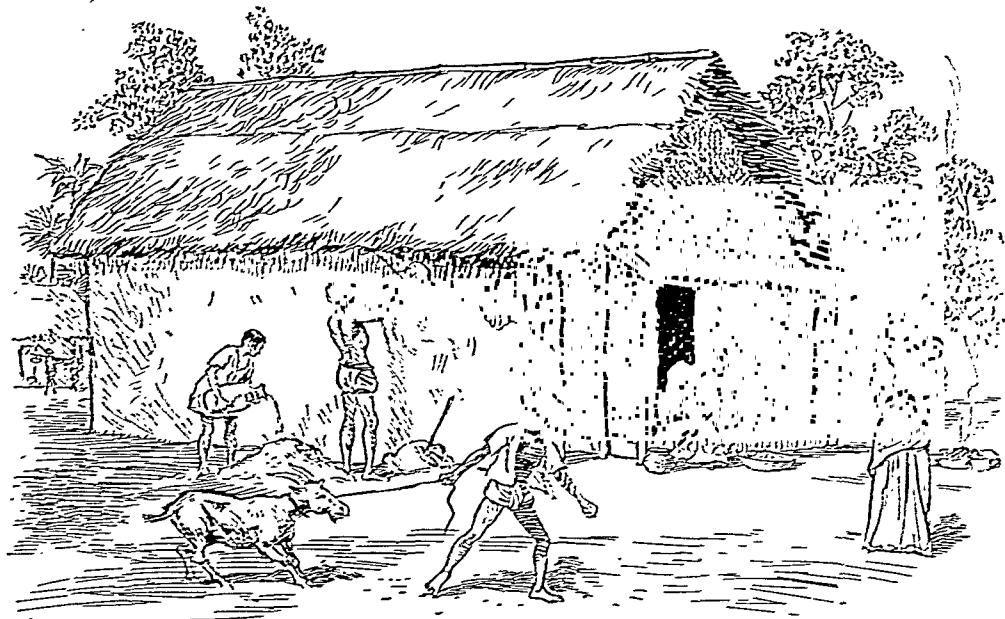


Ashok's mother does her washing by the river. She beats the clothes on the rocks to make them clean.

Ashok's hair is black. His dark skin helps to protect him from the hot sun. All the year round it is much hotter in India than in Britain. But in the middle of the hot season there is heavy rain, called the *monsoon*.

Ashok's father wears a turban, a long strip of material wound round and round his head. His mother wears a dress called a *sari*. It is really a length of cotton material wrapped round her.





Here is Ashok's house. His father built it on a frame made from bamboo which grows near his house. He plastered the walls and floor with thick mud, and then left them to be baked by the sun.

The roof is thatched with rice straw. It slopes steeply, so that the heavy rain runs off quickly.

The house was easy to build, for it has no windows and only two rooms.

Outside the low doorway is a porch where Ashok sleeps on the hot Summer nights.

Nine people live in the house, but Ashok does not think it is crowded, for the sun shines all the year round, and all the family are out of doors except at night.

Here is the inside of Ashok's house. There is very little furniture: only a few wooden chests, a coco-nut oil lamp, some large jars of water and a few brass pots and pans. In one corner is a bin of rice.



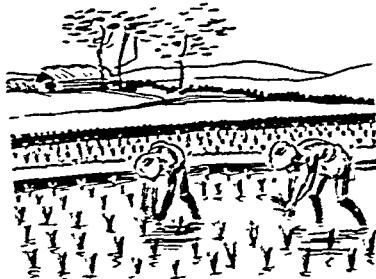
It is dark inside the hut because the only light comes from the doorway. At night Ashok's mother lights a coco-nut oil lamp. All the water in the village comes from the well, and none of the houses has a tap. Ashok's mother collects the water in a jar, and carries it on her head.



Ashok eats rice at nearly every meal, and to make it more exciting he sometimes has fish or spices and pickles.

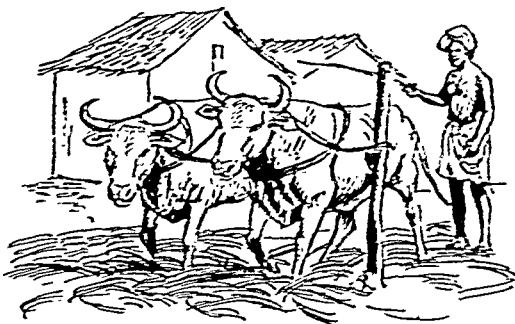
Ashok takes food from the large bowl. He uses a big leaf as a plate, and puts the food in his mouth with his fingers.





When the rice is ripe, it is cut, and spread out in the yard behind the house. Then the oxen trample on it to loosen the grain.

Ashok's father has a few small fields scattered about the village. The soil is very poor, but if he works hard he can grow enough rice to feed his family, and still have a little left to sell.



Ashok's mother collects the rice grains in a basket. She throws the grain in the air so that the chaff and dust blow away. The grain falls back into the basket again.

Then she crushes the grain to get rid of the hard skin, and the rice is ready for cooking.

Millions of people live in India, and there is not enough food for them all. Some farmers do not grow as much rice as they could. Their fields are too small, and they never put manure on them. The Government is trying to teach the farmers how to grow more rice.



There are no proper roads in Ashok's village, and the temple is the only building made of stone.

On his way to school Ashok sees the potter at work with his wheel, making water jars and pots from clay. The potter bakes them in his oven. Then he spreads them in front of his shop, and sells them to the people who go by.



At school Ashok often has lessons in the open air, in the shade of a banyan tree. Not every child in India goes to school yet, and Ashok will not be able to stay at school for long, for he must help his father in the fields.



ASHOK OF INDIA



Ashok enjoys his visits to the bazaar in the town nearby. Twice a week traders lay out their goods in the narrow alleys off the main street.

Ashok goes first to the fruit-seller who sells many brightly coloured fruits — bananas, oranges and mangoes.

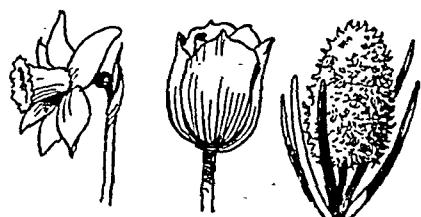
Flies swarm over the sweets on the sweet stall, but Ashok does not seem to mind.

The sacred white cows which wander up the street may eat the fruit and vegetables from the stalls. But the fruitseller will not hurt them because they are holy animals.



In Winter the bazaar is very muddy. In Summer it is hot and dusty. Ashok's mother goes there to gossip and to learn the latest news. She may buy spices to flavour the rice, or cotton to make a sari. But like all the people, she always argues about the price before she buys anything.

Piet's father is a farmer. He owns four large fields which are very flat. In the Autumn he plants out many bulbs—daffodils, hyacinths and tulips. In the Spring the fields are full of colour, and the scent of the flowers carries for miles.



Daffodil

Tulip

Hyacinth



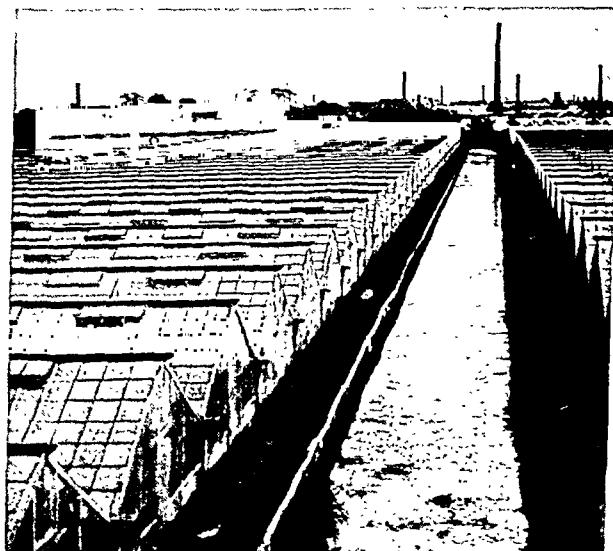
Picking tulips

People from all over Holland and even from other countries come to see the flowers. Piet sells huge bunches to the visitors.

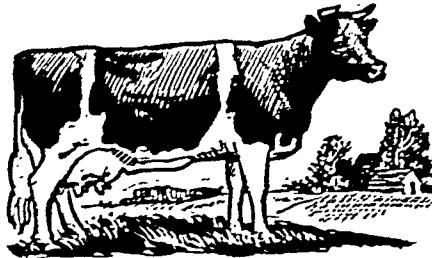
Then the rest of the flowers are cut and thrown away, for only the bulbs are wanted. If the flowers were left growing they would take all the goodness out of the bulbs.

Piet helps to lift the new bulbs, and he splits them from the old ones. The new bulbs are packed and sent to other countries.

Not far from Piet's home there are many huge greenhouses. Here tomatoes, grapes, lettuce and cauliflowers are grown. They are sent to Britain, Belgium and Germany.



PIET OF HOLLAND

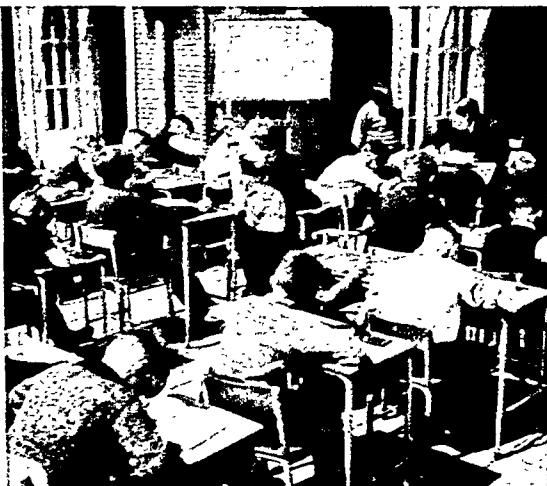


A Friesian cow

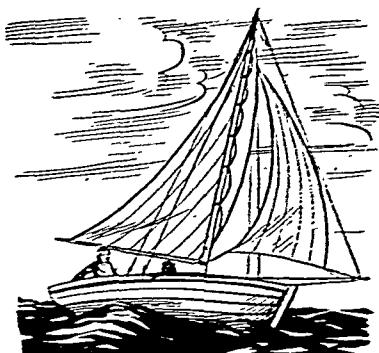
Each morning Piet sets off to school with his sister Bep. They find it easy to ride their bicycles along the straight road by the canal, because it is so flat.

Cycling is very safe too, because most of the roads have cycle tracks.

In those parts of Holland where there is good grass, the farmers keep many black-and-white cows, called Friesians. In the Autumn the farmer puts blankets on their backs to keep them warm. But in the Winter the cows live indoors in barns.



Piet has already started to learn English at school, and Bep learns French and German as well.

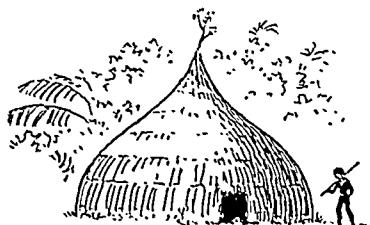


In the Summer the whole family goes on holiday on a sailing boat. In Holland there are many canals and lakes which are good for sailing.

Piet always takes his fishing rod on holiday, for there are many fish and eels in the canals.

LET'S REMEMBER PART 1

THE AMAZON FOREST



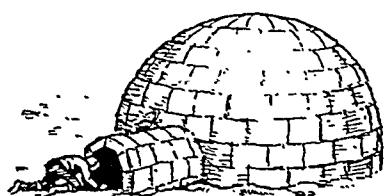
Peko's house is made from trees, creepers and leaves.

*A hot,
steamy forest*



His father hunts animals and catches fish. His mother grows cassava.

GREENLAND



Kara's Winter house is a snow igloo. In Summer she lives in a skin tent.

*A cold,
icy land*



Kara eats the flesh of seals. Her mother makes tents and clothes from seal skins.

ARABIA



Nasir's tent is easy to carry in the hot desert.

*A hot,
dry desert*



His family look for grass and water for their animals.

GREAT BRITAIN



Behind David's house are the barns, the dairy and the farmyard.

*Warm in
Summer*

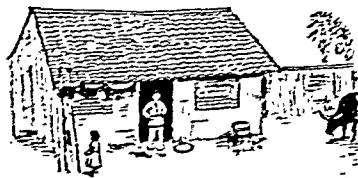
*Cool in
Winter*



David's father keeps cows, sheep, pigs and hens. He grows wheat and "roots".

LET'S REMEMBER PART 1

CHINA



*Hot, wet Summer
Cool in Winter*

Mud is plastered on a bamboo frame to make Chai's house.

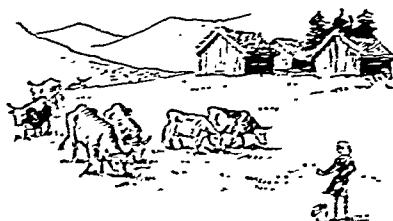


Chai's father grows two crops of rice every Summer. His sisters keeps silkworms.

NORWAY



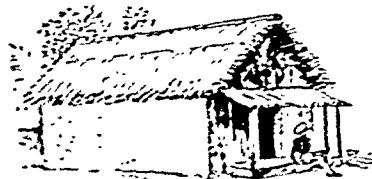
*Warm in Summer
Cold in Winter*



Sigrid's house is made from pine trees which grew on the mountain side.

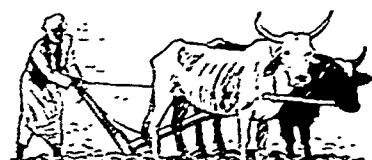
Sigrid's cows spend the Winter in the valley. In Summer they live on the saeter.

INDIA



*Hot, rainy Summer
Warm in Winter*

On hot nights Ashok sleeps on the verandah of his house.



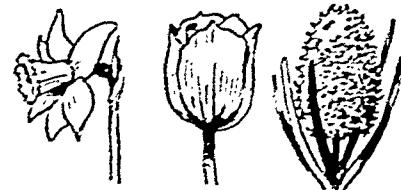
His father grows a little rice on his poor land. Oxen pull his plough.



HOLLAND

*Warm Summer
Cold Winter*

Piet's house is made of brick. Trees shelter it from the wind.



Piet's father grows bulbs on flat land which used to be under the sea.



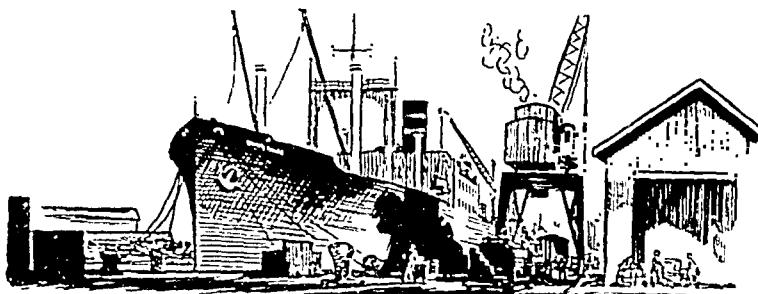
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CONTENTS OF PART 2

	page
About Part 2	68
Wheat from Canada	70
Rubber from Malaya	74
The Story of a River	78
How to Grow Bananas	81
Meat from Argentina	83
Cotton from the U.S.A.	87
Nylon and Rayon	92
Let's Build a House !	93
The Shape of the Earth	98
The Coal Miner	100
Food from Denmark	105
Winds and Directions	108
A Trawler Goes to Sea	110
“ Here is the Weather Forecast ”	115
Sugar from the West Indies	118
Valley and Hill	122
Growing Vegetables in Britain	124
Wool from Australia	126
Looking at Maps	131
Tea from Ceylon	134
Oil from Arabia	138
Do You Remember Part 2 ?	142

ABOUT PART 2



Coal and milk are delivered to Mrs. Bell

It is Friday. Mr. Bell has gone to work, and Peter and Susan have gone to school. Mrs. Bell is clearing the breakfast table. Oh ! There is the doorbell ringing. The coalman is at the back door. "Five bags, ma'am ?" he says, and while he puts them in the coal bunker Mrs. Bell picks up the bottles of milk from the step. She puts out a note telling the baker to leave two loaves.

Soon Mrs. Bell sets off for the shops. It is a cold day and rain is forecast, so she puts on her woollen coat and takes her nylon umbrella. Then she catches a bus to the town.

Mrs. Bell first takes Peter's shoes to the shoe repairer's. "Leather soles and rubber heels, please," she says.

At the butcher's shop she chooses meat for Sunday's dinner. What shall she buy : Argentine beef or New Zealand lamb ?



At the butcher's shop she chooses meat

Mrs. Bell goes to the grocer's shop and orders tea, sugar, butter, bacon and eggs. The grocer will deliver them.

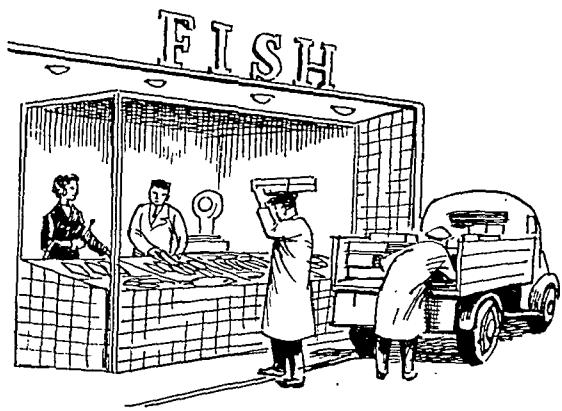
At the fishmonger's she buys a fillet of cod for her lunch.

The greengrocer has a window full of delicious fruit. Mrs. Bell buys bananas, apples and oranges. Then she buys vegetables. They are at the back of the shop where it is cooler.

Mrs. Bell goes into the new self-service store and quickly helps herself to matches, biscuits and floor polish. She pays for them on the way out, and catches the bus home.



The grocer sells butter, eggs, and bacon



Every day fresh fish is delivered to the fishmonger

Every day the Bell family needs many things from all over the world. This part tells you about some of these things. It tells you how rubber is made, and how fish are caught. It tells you how coal is mined, and how sugar and cotton are grown. It tells you of many other everyday things, and about the way in which they come to our factories and shops.

In this part you will also read about hills and valleys, about winds and the weather, about rivers, maps, and the shape of the earth.

WHEAT FROM CANADA

Most of us eat bread at almost every meal, and we know that we can always go to the shop and buy a fresh loaf. Millions of loaves are eaten in Britain every day. Loaves are made from the seeds of a plant called wheat. Where does wheat come from?

Some countries, such as Britain, cannot grow enough wheat to make all the bread they eat. So they have to buy wheat from countries which have plenty of farmland, and fewer people.

Much of the wheat for the bread made in Britain comes from Canada. In Canada the winters are very cold, but the summers are hot and fairly dry, and the wheat grows easily. Because of the cold winter, most Canadian farmers sow their wheat in spring. It is called "hard spring wheat".



An ear of wheat



A prairie farm in Saskatchewan, Canada

Here is a farm in Canada. Round the farm buildings are trees and hedges, which give shelter from the wind. The wheat lands, called prairies, stretch for miles and miles, and the fields and farms are very large.

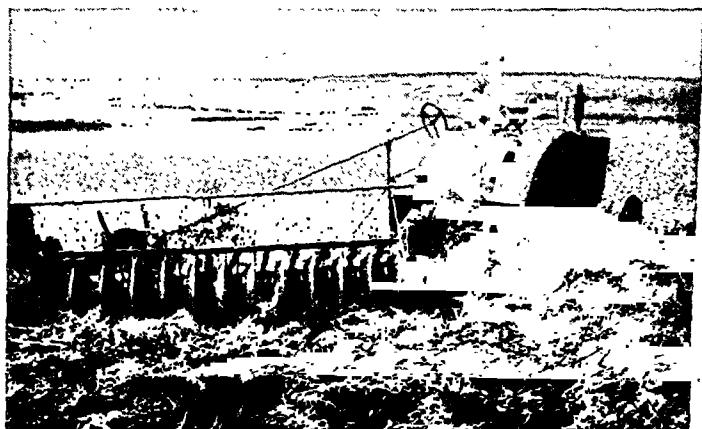
WHEAT FROM CANADA



The winter is a quiet time on the farm. The land is covered by a thick blanket of snow for four or five months, and it is very cold. Many houses have double windows to keep out the cold.

When the children go outdoors they wear thick coats, and they often wear caps with flaps, to keep their ears warm. The older children play ice-hockey, which is very popular in Canada. It is one of the fastest games in the world.

At the end of the winter the snow melts and the ground thaws. Then, in the spring, the soil is prepared for sowing the wheat seed. A harrow breaks up the soil, and the seed is sown in the warm moist earth.



The disc harrow breaks up the soil before the seed is sown

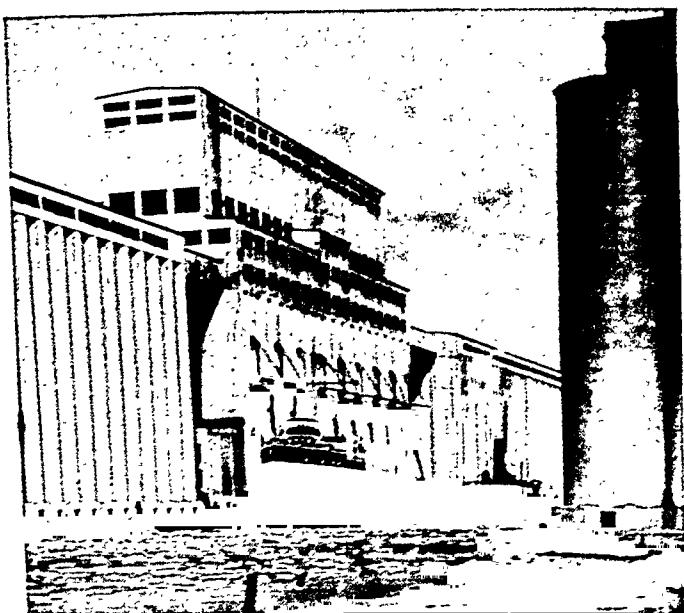
WHEAT FROM CANADA

The wheat grows and ripens during the hot summer. When it is golden brown, and the grain is firm, the farmer cuts it. He starts cutting when the morning dew has dried, and sometimes works until midnight. As long as the wheat is dry it can be cut.



The combine harvester reaps and threshes the wheat

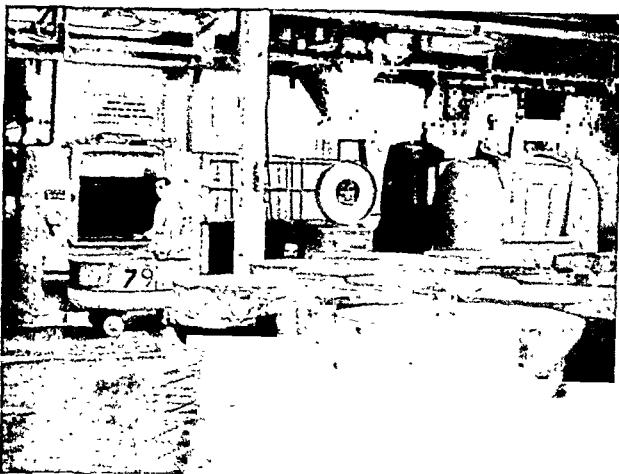
On the big level prairies, the farmer can make good use of his combine harvester. This is a wonderful machine which cuts the wheat and threshes it as well. The grain goes straight into a lorry, and the straw is blown back on to the field.



The lorry takes the grain to a country elevator. This is a storage tower where the grain is kept until a train takes it west to Vancouver, or east to the Great Lakes. Here the grain is stored in huge elevators until it is loaded into ships which take it all over the world.

Loading a ship at an elevator on Lake Superior

Some of the wheat comes to Britain. Britain cannot grow enough wheat to feed all her people, and in any case British wheat is too soft to make very good bread. So hard wheat from Canada, Australia or Argentina is mixed with the soft British wheat. Together they make good flour for bread-making.



Dough from the mixing machines rises in these pans

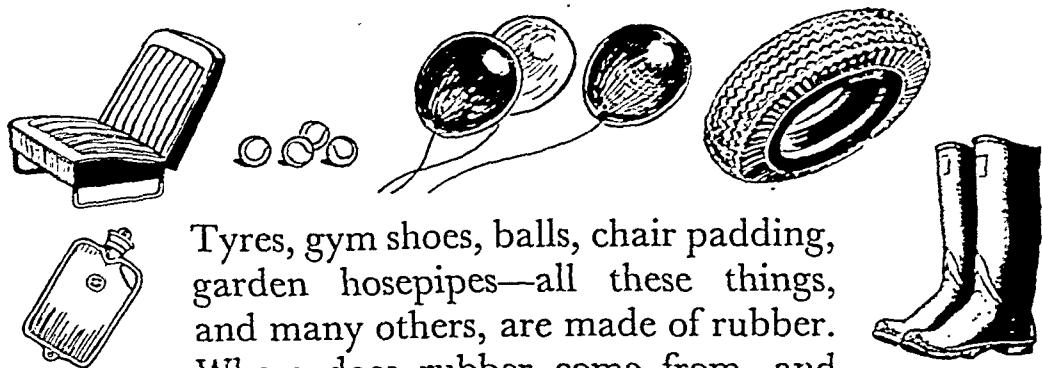
At the miller's, steel rollers crush the wheat grain, and turn it into flour. The baker mixes salt, water, and yeast with the flour to make dough. The dough is left in pans in a warm room. Then the yeast in the dough makes it rise, so that the bread will be light and full of air.



Machines fill the baker's tins with dough, and the tins are put in the electric oven. Two hours later the crisp, brown loaves are taken from the oven. Soon they will be in the shops. Remember next time you eat bread, that it may be made from wheat which grew in Canada.

Taking the loaves from the oven

RUBBER FROM MALAYA



Tyres, gym shoes, balls, chair padding, garden hosepipes—all these things, and many others, are made of rubber. Where does rubber come from, and what is it?

Rubber is made from a milky white juice, rather like the juice in a dandelion, which flows under the bark of the rubber tree. When the bark is cut, the juice, or *latex*, is collected in a cup.



Rubber trees grow wild in the thick forests near the River Amazon. There it is hot all the year round, and it rains nearly every day.

The rubber trees are scattered about the forest in little groups, a long way apart. They are hard to find. So about eighty years ago, rubber seeds were brought from South America to London.

Little trees were grown from the seeds and these trees were taken to countries with the same sort of hot, damp weather as the Amazon Forest.

A rubber plantation in Malaya

Today rubber is grown in Indonesia, Malaya, Thailand and Ceylon. In these countries there are plenty of men and women to look after the trees. In Malaya many of these workers come from southern India and China.



Houses of the estate workers



A rubber seedling

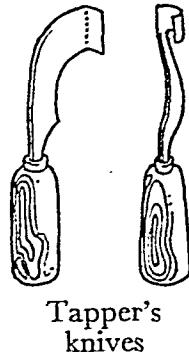
The workers earn more on the rubber estates than they could in their own villages in India or China, and they have better houses. Their houses are raised off the ground. They have overhanging roofs to give shade, and verandahs where the workers can rest in the evening.

It becomes dark by seven o'clock every night of the year in Malaya, and it is never cold or wintry. Rain falls nearly every evening.

At first the rubber seeds are planted in baskets. As the seedlings grow, they are shaded from the hot sun. When they are strong enough, they are planted out, about fourteen feet from each other, so that they have plenty of room to grow to full size.

Planting out a rubber seedling in its basket. Two seedlings are planted beside each planting peg. Later the weaker seedling is removed





Small plants are grown near the seedlings. They keep the soil damp, by protecting it from the sun, and they help to keep down the weeds. The plants also stop the soil being washed away by the rain, or blown away by the wind.

After about five years the trees are thirty feet high, and ready for "tapping".

The tapper, who collects the latex from the trees, starts work before the sun is hot, at six o'clock in the morning. She uses a sharp tool and makes a sloping cut, like a little shelf, half-way round the tree. At the end of the cut she puts in a spout, and on the spout she hangs a cup.



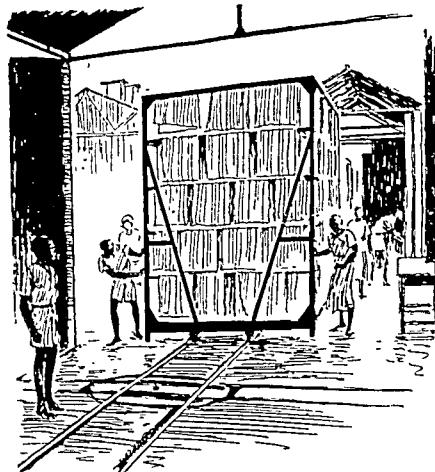
The tapper makes a sloping cut in the bark of the tree



Pouring the latex into a lorry

Very, very slowly the latex trickles into the cup. Each tapper looks after four hundred trees, and taps half of them each day. When the last tree has been tapped, the latex from the first is ready to be collected. Later, the latex is taken by a lorry to the factory.

At the factory, acid is added to the latex. This separates the rubber from the liquid. The rubber is rolled into flat sheets and hung on frames which are pulled into a heated shed filled with wood smoke. When the sheets are dry they are baled ready for shipment.



Pulling a rack of sheet rubber into the drying shed

Rubber gloves are made by dipping *formers* into liquid latex. Tyres and hot water bottles are made in moulds from sheet rubber.

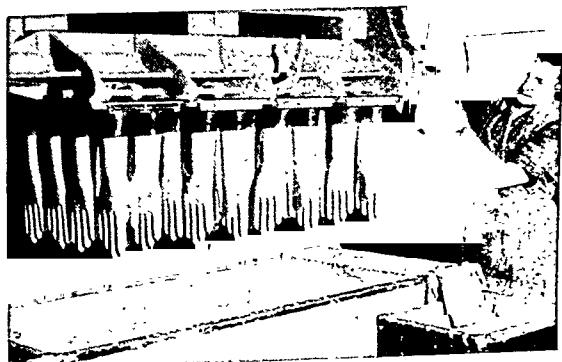
But even the millions of rubber trees in Malaya, Ceylon and Indonesia cannot produce enough rubber for our needs. So men have made *synthetic*, or artificial rubber. For some things it is better than natural rubber.



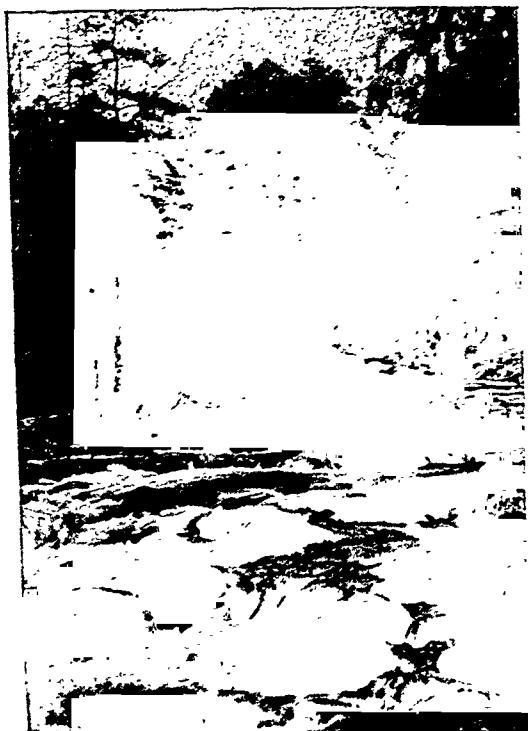
The rubber is rolled into flat sheets

Rubber is used most in countries which have many motor cars : in the United States of America, Britain and other countries in Europe. In these countries the rubber sheets are pounded, torn, kneaded and sliced in huge machines, to make them soft and sticky, like putty. Sulphur is added to harden the rubber so that it will bounce back into shape.

Making rubber gloves



THE STORY OF A RIVER



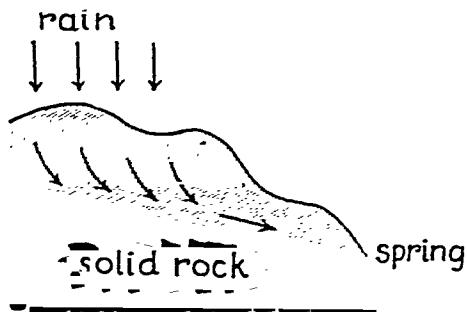
A river in Wales

At the end of winter, if the snow melts quickly, the stream becomes a torrent. In dry weather the stream is just a trickle, or it may even dry up.

Some of the rain which falls on the hills never reaches the stream, for it sinks into the ground. If it reaches a layer of solid rock, which it cannot pass through, it runs along the top of the underground rock until it finds a way out. Then it bubbles out of the ground as a spring.

It is a fine sight to see a stream in the mountains after a rain-storm. The water rushes along, splashing over the rocks. Sometimes it makes little waterfalls.

The stream gradually makes a narrow, steep-sided valley for itself. It flows so quickly that it carries stones and mud along with it. When the stones are first broken off by the stream, they are sharp and jagged. But the rushing water whirls them on, crashing them against each other and wearing them down until they are round and smooth.



How a spring is formed



Here is a river which started as a mountain stream. Other streams, called *tributaries*, have joined the river making it larger. Now the valley is wide, and the hills on either side are gently curving. We can row boats and swim in this part of the river, for the water flows much more slowly than it did in the mountains.

No rocks stick out of the water, and the river is not flowing fast enough to move large stones. But it is still carrying along fine mud and pebbles.

At bends in the river the current wears away the outer bank. Near the inner bank, where the water moves more slowly, the sand and gravel sink to the river bed.



At bends in the river, the current wears away the outer bank

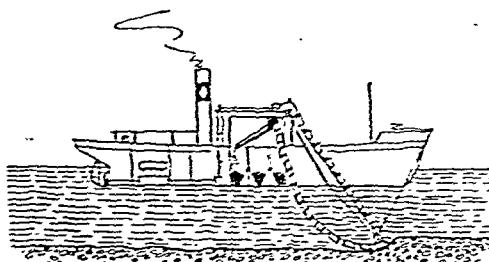
THE STORY OF A RIVER



Flooded fields beside a river

When the flood water has gone, these "water-meadows" are covered by fine mud. This makes the grass grow well, so that there are heavy crops of hay, and rich grazing for cattle.

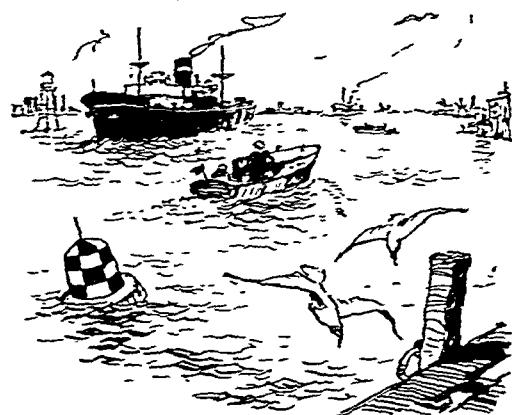
Some rivers have deep channels when they reach the sea, and ocean-going steamers can anchor in them. Docks are built where there is calm water so that ships can unload cargoes and passengers.



A dredger clearing mud from the river bed

When the river reaches the flat land, it winds slowly to the sea, so slowly that it cannot carry even the finest mud, which it drops on the river bed.

When heavy snow has melted, the river cannot carry away all the water from the hills, and the flat fields nearby are flooded.



Big ships can anchor in the mouth of the river

Sometimes there are mud banks at the mouth of a river. Then *dredgers* have to keep a channel clear. River pilots go on the big ships to steer them clear of the mud banks, which are marked by buoys.

HOW TO GROW BANANAS

Amos Jones is a negro who lives in Jamaica. He has saved some money and wants to grow bananas. How does he set about it?

First he buys a piece of land and clears away the tangled undergrowth. (Jamaica is a hot, wet country where trees, bushes and weeds grow easily.) Then Amos and his friend Len dig ditches to store the rain water, and put pieces of banana root into the ground.

Soon the roots send out shoots which grow into fine banana plants. After a year the plants are about fifteen feet tall, with purple flowers.



Amos holds a banana root



A flower bud

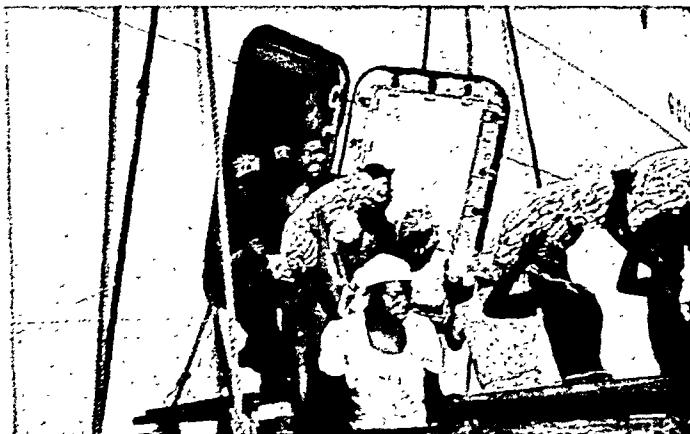
When the flower petals fall, tiny bananas begin to grow. Each plant produces one bunch of bananas, and the bunch may contain over a hundred bananas.

When the bananas are fully grown, and while they are still green and unripe, Amos and Len cut them down. Amos uses a long pole with a knife at the end. He cuts into the plant, lowers the heavy bunch on to Len's back, and cuts off the bunch with his big knife, called a *machete*.



Watering the young banana plants

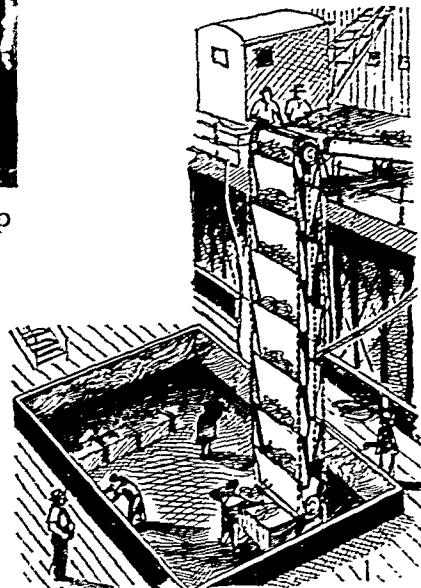
HOW TO GROW BANANAS



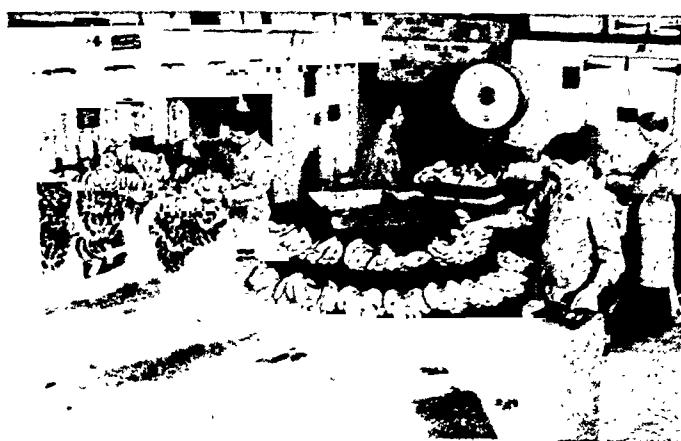
Bananas, wrapped in plastic, are loaded into a ship

In the holds (the store-rooms of the ship), the bananas are kept cool, so that they do not ripen on the voyage. They are unloaded by special machines which carry them in canvas pockets so that they are not bruised. Then the bananas are hung in warm rooms where they ripen and turn from green to golden yellow.

Soon Amos sells his first load of bananas to a merchant, and they are loaded into a ship.



An elevator lifts the bananas from the holds



A dealer buys the bananas. He cuts the "hands" of bananas from the stalk, weighs them, and puts them in boxes. Soon Amos Jones' bananas are being sold in the greengrocers' shops.

Cutting, weighing and boxing the bananas

MEAT FROM ARGENTINA

Señor Pastor has an *estancia*, or farm, in Argentina. He keeps thousands of cattle. When the cattle have grown fat they are killed and sold for meat.



The *pampa*—the flat grassland of Argentina

The flat grassland, where the cattle graze all the year round, is called *pampa*. It stretches for miles and miles. Although the soil is good, it is not damp enough for trees to grow.

Señor Pastor's farmhouse is large and up to date. Since his farm is far from the nearest town, he uses a windmill to make his own electricity.



Behind Señor Pastor's *estancia*

Behind the house are workshops for the blacksmith, the harness maker, and the men who look after the cars. There are garages for the cars and tractors, milking sheds and an office.



Lassoing a steer

Manuel is a cowboy on the farm. In Argentina he is called a *peón*. He has a strong horse and he is a very good rider. He rounds up the cattle by galloping round them, and he can lasso a steer even when he is riding at full speed.

Why do you think Manuel wears different clothes from a British cattleman? Why does he have spurs on his boots, a hat (called a *sombrero*), and a neckerchief?

At least once a year, the cattle are rounded up for counting and branding. Manuel and the other *peones* lasso each steer in turn.

To brand a steer, they make a special cut in its cheek. The cut shows that the steer belongs to Señor Pastor.

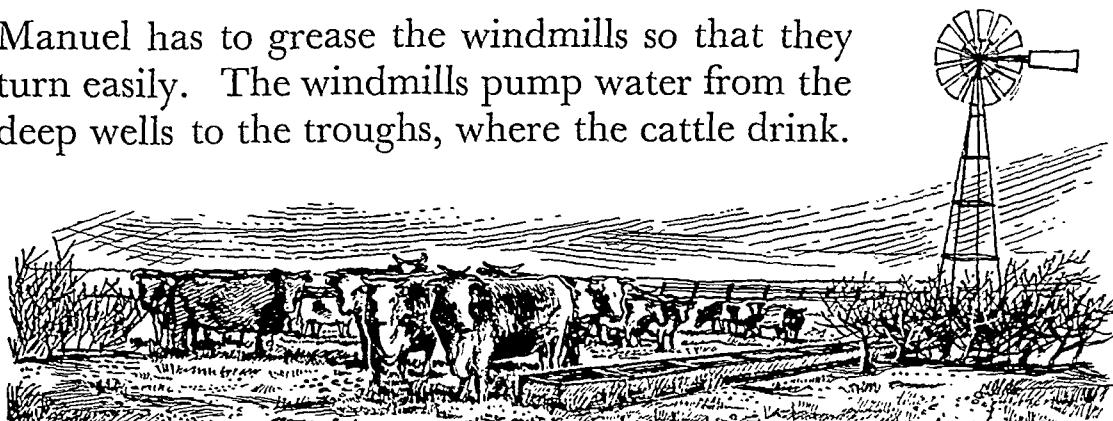
The steer is not branded on its body, as this would spoil its hide, which one day will be made into leather.



In the stockyard. A calf has been lassoed before being branded

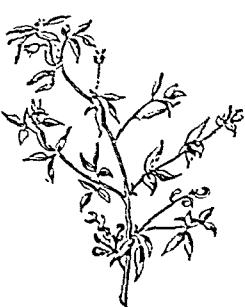
But most of Manuel's days are not so exciting as you might think. For he has much hard work to do. He rides round the miles of wire fences, and mends any which are broken. He also has to see that the cattle are moved to a new pasture when they need fresh grass.

Manuel has to grease the windmills so that they turn easily. The windmills pump water from the deep wells to the troughs, where the cattle drink.



On part of the estancia, Señor Pastor grows *alfalfa*, which is like the clover we have in our fields.

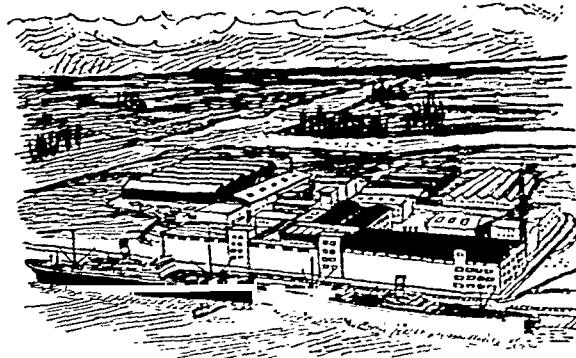
When the alfalfa is fully grown it is cut and left to dry. Then it is put into stacks rather like our haystacks.

For most of the year there is plenty of grass for the cattle. But sometimes in the summer, when it is hot and there is no rain, the grass dries up. Then Manuel feeds the cattle with alfalfa.

When Señor Pastor has a few hundred good beef cattle which are fat enough for killing, Manuel and the other *peones* round them up and drive them to the railway.

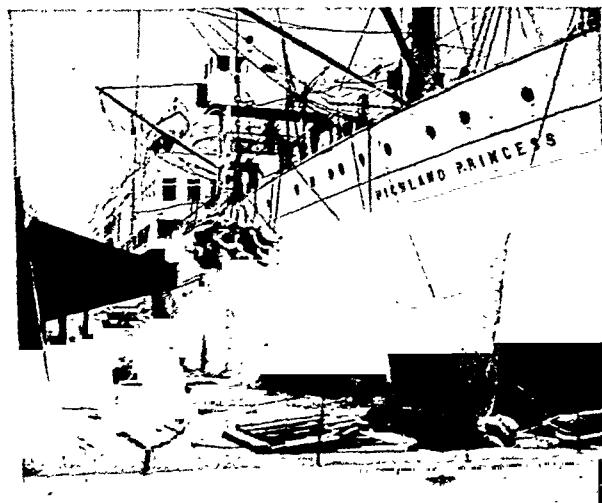
Alfalfa

MEAT FROM ARGENTINA



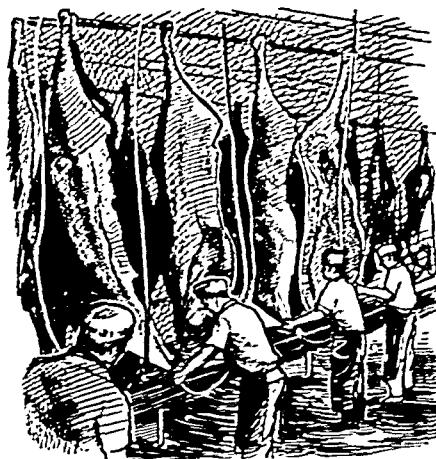
Ships being loaded at a meat factory on the River Plate

Skilful butchers carve them up, so that every part of them can be used. Some of the meat is tinned and made into "corned beef", but most of it is "chilled", or partly frozen. It is not fully frozen, as that would spoil the taste. Special ships, with cold storage rooms, take the meat to other countries.



Unloading meat from a ship in London docks

The railway trains take the cattle to a large factory at the mouth of the River Plate. The factory is spotlessly clean inside, and all the workers wear white overalls. Here the cattle are killed, without pain.



Butchers wash and carve up the carcasses

Most of Señor Pastor's meat is sent to Britain. From the docks it is at once taken to the big markets, such as Smithfield in London. Dealers buy the meat and sell it to the butcher, who soon has it for sale in his shop. He knows that beef from Argentina is good to eat.

COTTON FROM THE U.S.A.

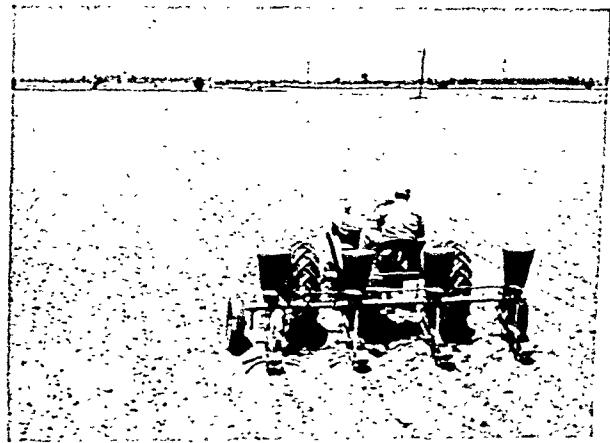
Let's look in Mr. Davey's shop windows. One is full of gay summer clothes. There are frocks, blouses, shirts and vests. Now look in the other window : there are materials, sheets and tablecloths.



Nearly everything in Mr. Davey's windows is made of cotton, which comes from the cotton plant. Cotton thread for sewing is made from the fluff inside its seedpod.

Cotton grows best in warm lands which have rain in the spring, followed by a warm, dry summer. Much raw cotton comes from the southern states of the U.S.A. Good cotton is also grown in Egypt, the Sudan and the West Indies. The cotton from India and China is not so strong.

In the U.S.A. the cotton planter has to be sure that all the winter frosts are over before he plants his cotton seeds. A few days after the seeds have been sown, the seedlings break through the ground. With the help of the rain and the warm sun, they grow quickly.



Planting the cotton seeds

COTTON FROM THE U.S.A.



Cultivating the young cotton plants

The seedlings are thinned, so that only the strong, healthy plants are left.

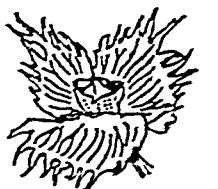
Weeds grow even quicker than the cotton plants, but hoeing between the rows keeps them down. Here you see a tractor hoeing five rows at once.



Cotton plant



Flower



Seed pod or boll

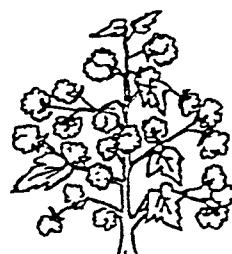
By August, four months after the seeds were sown, the *cotton plants* are about three or four feet high.

Cotton is a relation of the hollyhock, as you can see from the shape of the creamy-coloured flowers.

When the petals fall, they leave behind the seed pods, called *bolls*.

Inside each boll are thirty or forty seeds, each the size of a little pea. When the seeds ripen, the boll bursts open.

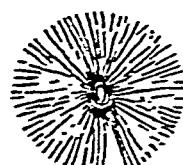
Each seed looks rather like the seed of a dandelion, for it is covered with white fluff, called *lint*. The lint is the raw cotton.



Cotton in boll



Ripe boll



Seed cotton

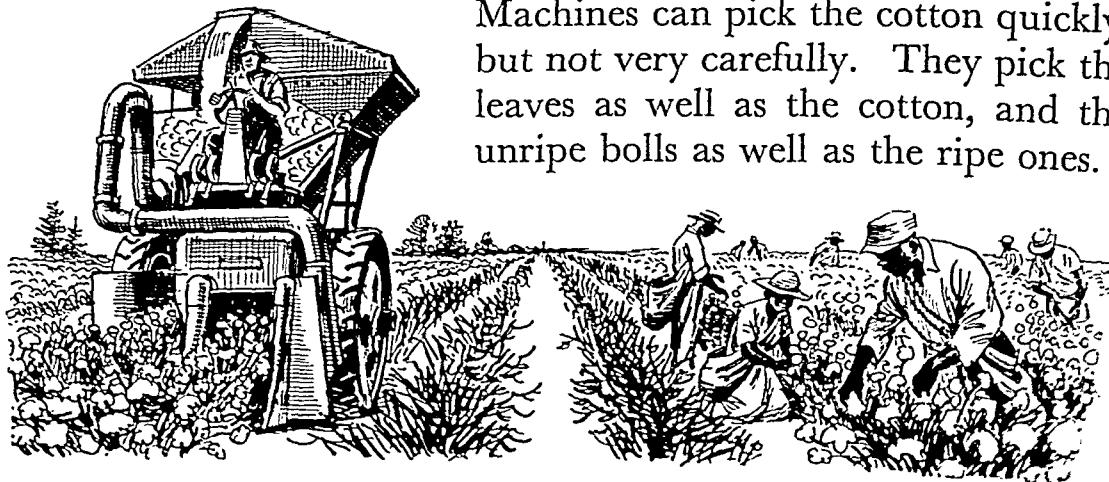


If the cotton crop has boll weevil, an aeroplane sprays it with insecticide

Although cotton grows easily, a heavy rainstorm can ruin the crop if the bolls have only just burst open. Sometimes a little insect called the boll weevil eats into the bolls. A low-flying aeroplane may be used to spray the fields to kill the weevil.

Here is a family at work picking the cotton when the bolls have burst. Not all the cotton is ready at the same time, and so they are picking the lint from the ripe bolls only. Each picker puts the lint he has picked into a sack tied to his waist.

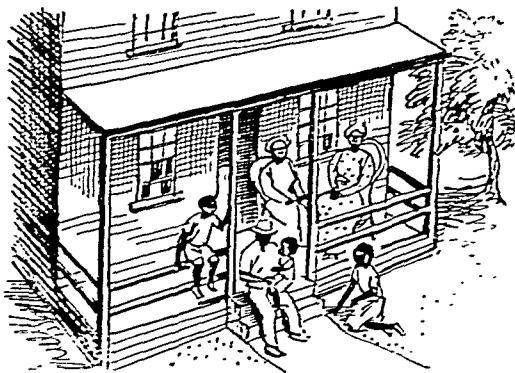
Machines can pick the cotton quickly, but not very carefully. They pick the leaves as well as the cotton, and the unripe bolls as well as the ripe ones.



Picking cotton by machine and by hand

COTTON FROM THE U.S.A.

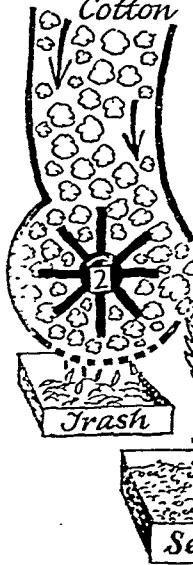
Most of the people who work in the cotton fields of the United States are negroes, whose ancestors were taken as slaves from Africa to America. Today there are no slaves in America, and many negroes grow their own cotton on their own land.



Cotton pickers outside their house

How a cotton gin works

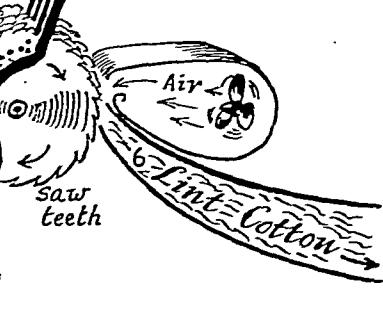
1 Seed Cotton



On the cotton plantations many of the workers live in wooden houses, with verandahs where they sit out on hot summer evenings. Every summer some of their friends from the city stay with them, and spend their holidays picking cotton.

The sacks of cotton are emptied into big baskets at the end of the rows. Carts take the cotton to a factory where a machine, called a *gin*, tears the fluffy lint from the seeds.

4 bars

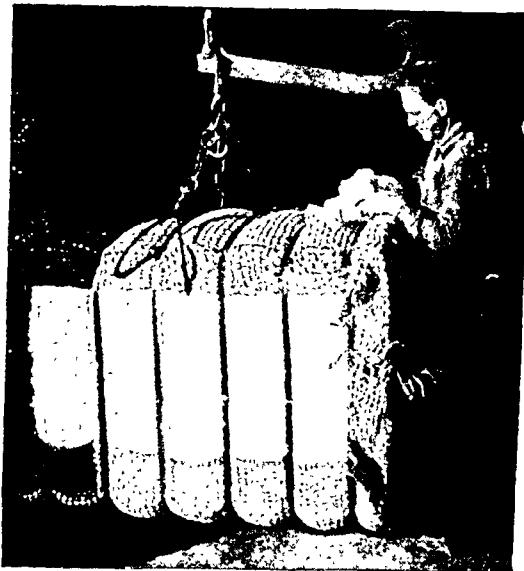


1. Seed cotton enters gin
2. Seed cotton is thrown against fast turning saws
3. Saw teeth take cotton up and against bars
4. Bars hold back seed, but let lint cotton through
5. Seed falls down into conveyor
6. Lint on saw teeth is carried away by blast of air

Some of the seeds will be used for next year's planting, but most of them are crushed to squeeze out the oil which is in them. This oil is used to make margarine. The crushed seeds are made into cattle food, to feed cows in winter time.

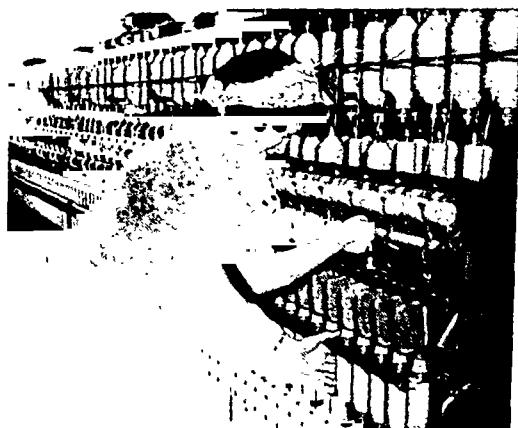
The raw cotton is packed into bundles, called *bales*. The bales are wrapped in sacking, and held firm by metal bands. Then they are sent by ship all over the world.

Most of Britain's raw cotton arrives at Liverpool, where some is unloaded. The rest goes up the Ship Canal to be unloaded at Manchester, and sent to cotton mills in many parts of Lancashire.



Taking a sample from a bale of cotton

In the cotton mills all the small threads of cotton are cleaned and combed by large machines. Then they are spun, or twisted together, so that they make one long thread. When the raw cotton is being twisted into thread, it must not get too dry, or the threads would break.



Spinning cotton in a Lancashire mill

That is why most of our cotton mills are in Lancashire, where the air is usually damp. Looms weave the threads into fine cloths, which are printed with gay patterns and sold all over the world. What a wonderful plant cotton is ! It gives us clothes, sheets and curtains, margarine, and even cattle food.

NYLON AND RAYON



Inside a nylon factory in Wales

Nylon does not grow on a plant like cotton, nor does it come from an animal as wool does. It is a new material, made by men and machines. Chemicals made from coal, air and water are treated to make nylon *polymer*, which looks like chips of white marble.

These chips are heated to make them into a liquid, which is forced through tiny holes.

As each jet of liquid dries, it becomes a strong thread.

Nylon is made into stockings and all kinds of clothes. Usually these clothes do not need ironing.

Sometimes nylon is mixed with cotton or wool to make the materials stronger.

Because nylon is strong, it makes good ropes, parachutes, fishing lines and firemen's hoses.

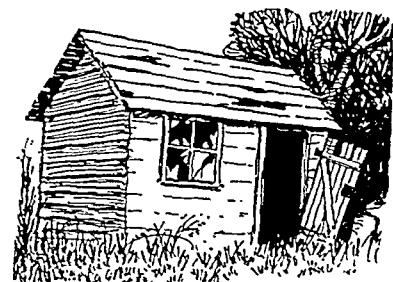
Rayon, or "artificial silk", is another man-made material.



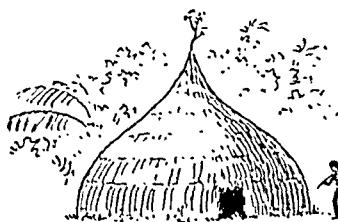
Inspecting bobbins of nylon yarn

LET'S BUILD A HOUSE !

Would you like to live in a house like this ? It has no gas, no electricity, no water and no drains. But there are other reasons why it would be a bad house to live in. Can you think of them ?



Is this a good house ?



A hut in the Amazon forest must be specially made to keep out the cold. A house in the hot forests must be cool, and its roof must keep out the heavy rain. In Britain, and in other countries with the same sort of weather, houses must be warm in winter and cool in summer.



A house in India

A house must be made of materials which are easily found nearby.

Most building materials are heavy, and it is costly to move them far. Houses in Sweden, and other countries with many trees, are often made of wood. Chinese houses have bamboo frames ; Indian houses have roofs thatched with rice straw. Egyptians make houses of mud-bricks, dried in the hot sun. In Britain most houses are built of bricks, made from clay.



A house in Norway

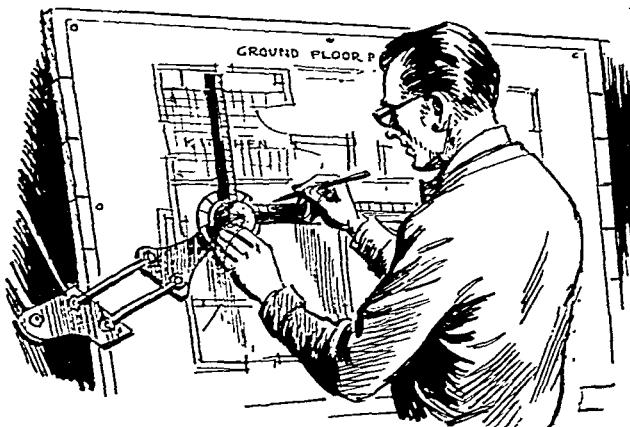


A house in Great Britain

LET'S BUILD A HOUSE!

Let's build a house ! First we must decide where to build. Then a surveyor makes a careful plan of our plot of land. He shows the size and shape of the plot, and where are the nearest gas, water and electricity supplies, and drains.

Wood, stone, concrete or brick—which shall we use ? Wood is expensive in Britain, because there are few forests. If we live in an area with a good local stone—near Aberdeen, in the Cotswolds, Derbyshire or parts of Yorkshire—we shall probably use stone.



The architect draws a plan of the house

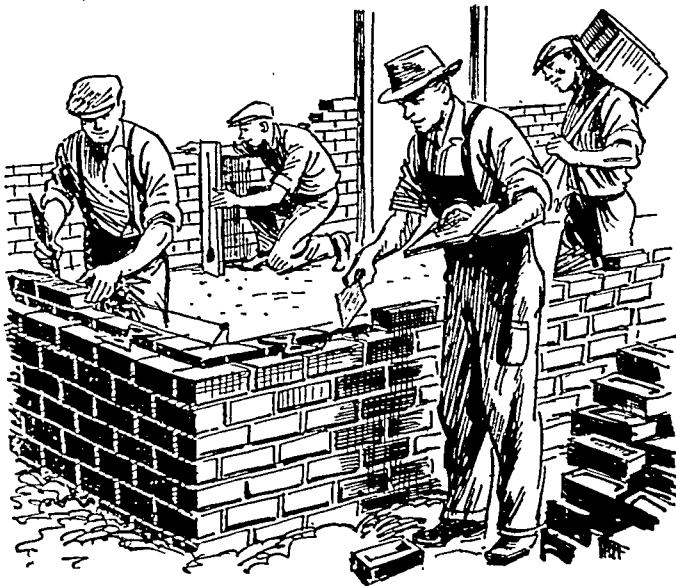
An *architect* draws a plan of the house, showing every wall, door and window. The builder and his foreman mark out the shape of the house on the land.

Concrete, on a steel frame, is very good for large buildings. But in most parts of Britain we shall probably use bricks, which can be made of local clay, or which can be brought from brickworks in other parts of the country.



The builder marks out the shape of the house on the land

Shallow trenches are dug along the lines which mark the position of the walls. Then the builder's men make concrete. Sand, cement, small stones and water are all churned together in a concrete mixer. When the mixture is poured into the trenches it sets as hard as a rock. This makes a firm base for the walls.

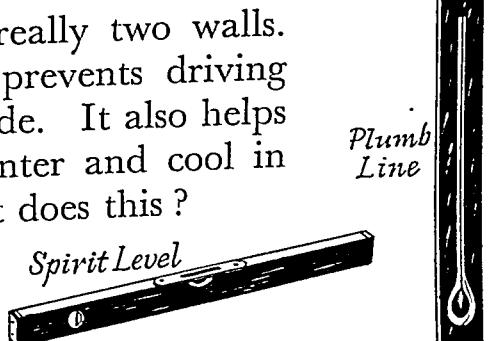
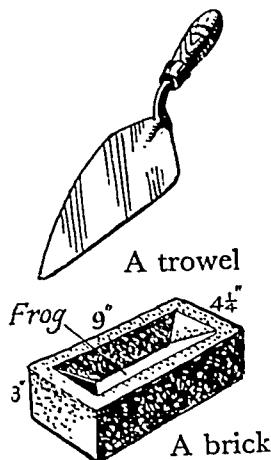


Bricklayers making a cavity wall

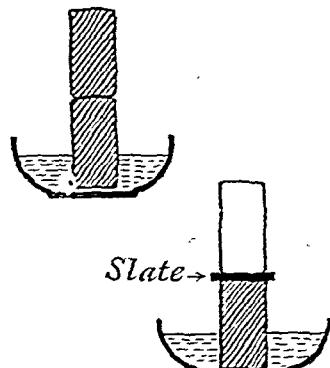
Now the bricklayers start work. Here are the things they use. The trowel has a broad steel blade and a firm wooden handle. The bricks are 9 in. long, 3 in. high, and $4\frac{1}{4}$ in. wide. The "frog" or hollow in the top helps to grip the mortar. Mortar, which is used with the bricks to make a wall, is made from cement or lime, mixed with sand and water. Like the concrete, it soon sets hard.

You can see that the wall is really two walls. The space between the walls prevents driving rain soaking through to the inside. It also helps to keep the house warm in winter and cool in summer. Can you think how it does this?

Why does the bricklayer use a spirit level and a plumb line?



LET'S BUILD A HOUSE!



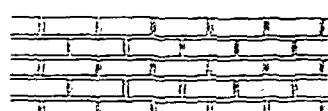
How a damp course works

Just above the ground the bricklayer lays a damp course. This is a layer of bitumen or slate. Water cannot pass through it, and so the damp cannot rise up the wall. To see how the damp course works, stand two bricks in water, one on top of the other. Water will slowly creep up both bricks. But if you put a slate between the bricks, water cannot pass through it, and the top brick will remain dry.

When the bricklayer makes a wall he *bonds* it. Can you see the difference between these two walls? The top one would easily crack. In fact, you could probably push it over yourself, because all the joins between the bricks are exactly above each other. The wall made in a *stretcher bond* is much stronger.



A bad wall



Stretcher bond

Now the house is beginning to take shape. The bricklayers leave gaps in the walls, so that the joiners can fit doors and windows.



The roof is built on a timber frame. First the *ridge* is set between the two ends of the roof. *Rafters* are fixed between the ridge and the *eaves*. Then *laths* are put across the rafters to take the tiles.

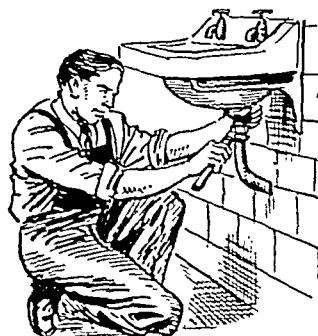
The roof tiles are made of clay. The nibs on the back of the tile are placed over the laths, and two nails are driven through holes in the tile to hold it firmly in place.



The joiner



The plasterer



The plumber

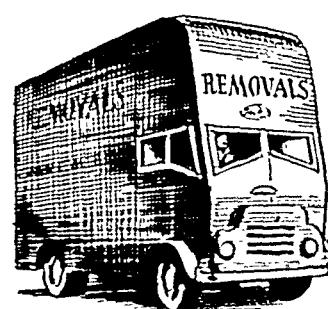
As soon as the roof is on, the builder's men start work inside the house.

The joiners lay the floors, and fit the doors, windows and stairs. The walls are plastered and the plumber fits water tanks, basins, sinks and lavatories. The electrician wires the house, and men from the gas, water and electricity companies connect the house to the main supplies.

Last of all the painters set to work, painting and decorating the whole house, inside and out. As soon as the paint is dry, we can move in to our new house.

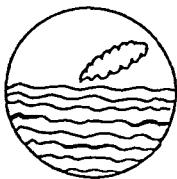


The painter

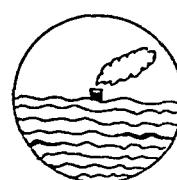


The furniture van

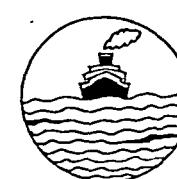
THE SHAPE OF THE EARTH



1



2

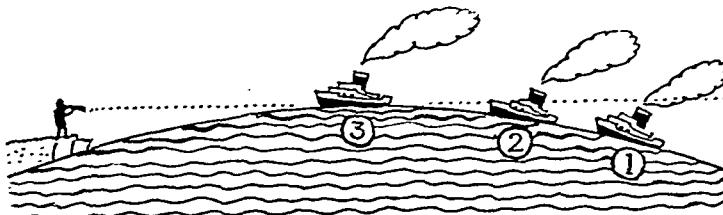


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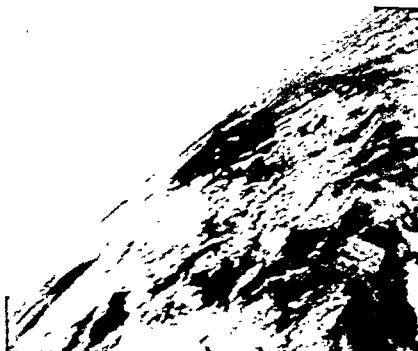
Our world is a huge ball spinning in space. For many years it was believed that the earth was flat, and long ago there were many sailors who would not sail far from land, because they were afraid of falling off the edge of the earth.

We can prove that the earth is round if we look through a telescope at a ship coming towards the land. This is what happens :

1. The smoke appears over the horizon.
2. We see the funnel and top parts of the ship.
3. The whole ship can be seen.



This drawing shows how the ship comes over the horizon. (The earth is not really curved as much as this, of course.)



A photograph of the earth taken from a rocket

This photograph of the earth was taken from a rocket over one hundred miles high. If you put a ruler on the outline of the earth you will see that the earth is curved.

THE SHAPE OF THE EARTH

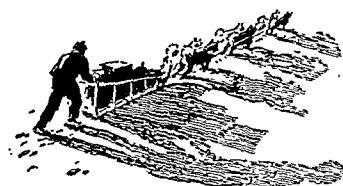
The sun gives light and warmth to the earth.

At the *equator* (an imaginary line round the middle of the earth), the sun is almost overhead all through the year. The equator passes through the Amazon forest of Brazil, Kenya and the Belgian Congo. All these countries have hot weather every day.



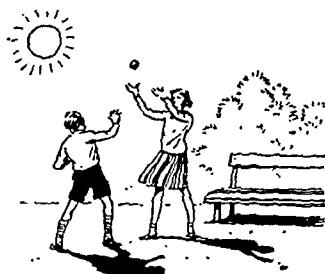
Near the equator

At the north and south *poles* it is very cold all the year round, because the sun is never very high in the sky.

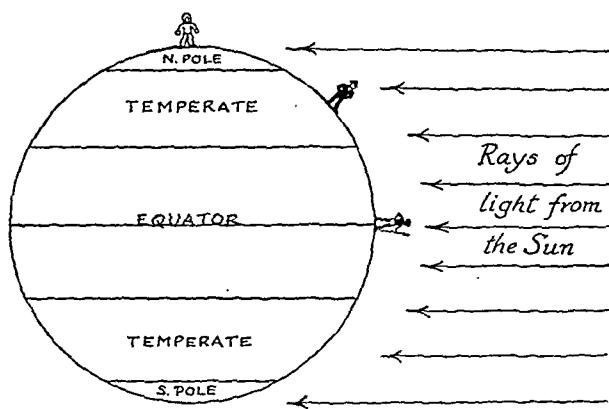


At the pole

There are more temperate lands between the equator and the poles, lands where it is never very hot and never very cold. Britain is one of these lands; another is New Zealand, in the southern half (or hemisphere) of the world.



In a temperate land



How the sun shines on the earth

At midday on March 21st a man at the north pole sees the sun just over the horizon.

In Britain the sun is half-way up the sky.

At the equator the sun is directly overhead.

THE COAL MINER



A coal forest, millions of years ago

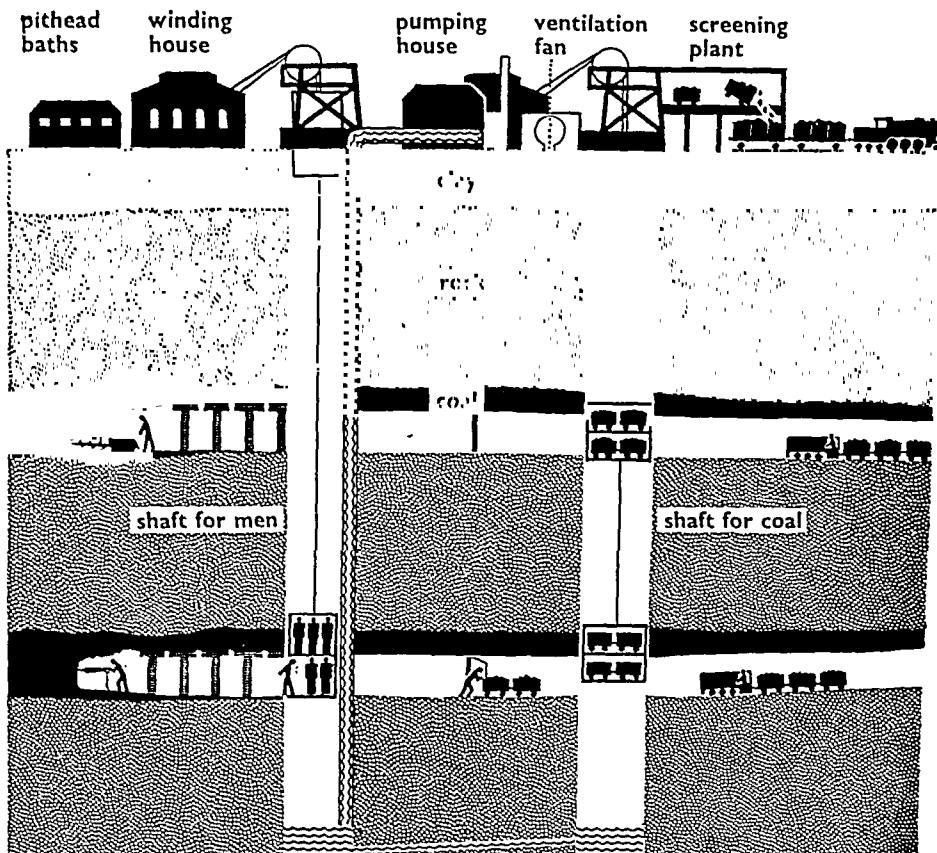
Deeper and deeper the forests were pressed under the earth. After millions of years the buried trees were changed into the hard, black stuff which we call coal.

Here is a coal mine in the north-east of England. Under the big wheels are two holes, called *shafts*, which are dug deep into the ground. The railway wagons stand by to take away the coal.



On the opposite page is a picture showing a slice cut through a coal mine. The picture shows the buildings at the pit top, the two shafts, and two *seams*, or layers, of coal.

A coal mine in the north of England



In this picture you can see :

- pithead baths* : the men have a bath here after work.
- winding house* : here is the engine which lowers the cages, and pulls them up again.
- pumping house* : the water which collects at the bottom of the mine is pumped to the surface.
- ventilation fan* : this sucks used air out of the mine, and draws fresh air in.
- screening plant* : the coal is washed, then sorted into sizes by the screens.
- shaft for men* : at the top is an empty cage ; near the bottom is a cage full of men.
- shaft for coal* : near the bottom is a cage of empty tubs going down ; half-way up is a cage of tubs full of coal. The shafts are wide enough for two cages.

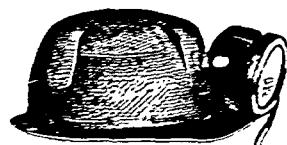
THE COAL MINER



The miner takes a water-bottle and a tin of food

Work in the mine goes on for twenty-four hours a day. There are three shifts, each of eight hours. Ted Bates is one of the miners on the morning shift this week. As he starts work, the men of the night shift are going home. When Ted finishes work, the men of the afternoon shift will take over.

When he arrives at the pit Ted changes into his working clothes. Why do you think he wears a helmet, boots with steel toe-caps, and knee-pads?



A helmet and lamp

Sometimes there are dangerous gases underground in the mine. These would explode if anyone lit a match. So Ted always leaves his matches in his locker before he goes down the mine.



A hand lamp



Collecting a lamp, before going underground

At the lamp-room he collects his cap lamp and gives the lamp man a ticket, or check for it. When there has been an accident underground, the manager looks at these checks, and quickly sees which men are still in the pit.

At the start of his shift, Ted Bates goes into a cage at the top of the shaft. The cage is quickly lowered, on its strong steel rope, and in a few seconds Ted is hundreds of feet below the ground, far away from the sunlight.



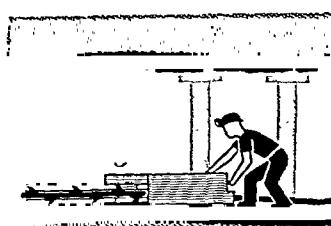
Riding to the coal face on the "paddy mail"



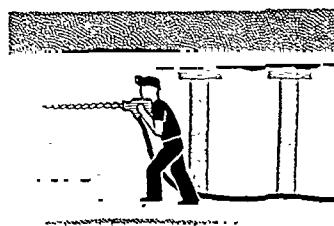
The men in the cage are ready to go down the mine

The place where Ted works, called the *coal face*, is over a mile from the shaft bottom. He rides there on the *paddy mail*, a little train which carries the miners to their work.

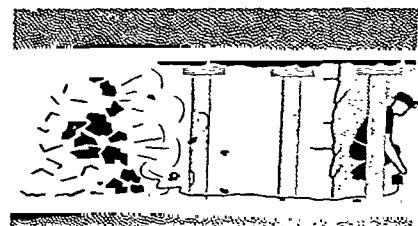
At the coal face Ted finds a heap of coal ready to be cleared. These three pictures show what the men of the night shift did, before Ted came to work.



Using a coal cutter to under-cut the coal seam

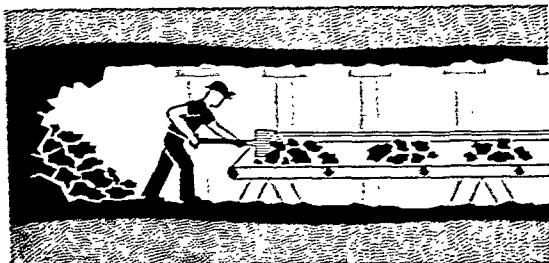


Drilling shot holes in the coal face

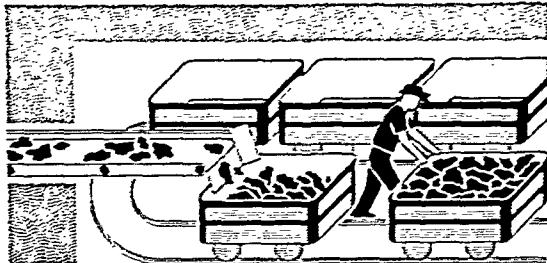


Blowing down the coal with explosive charges

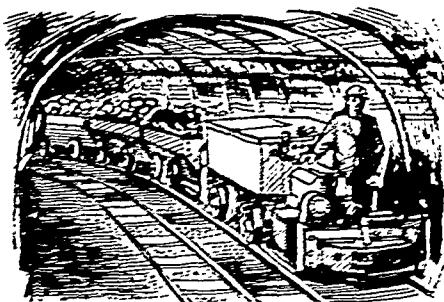
THE COAL MINER



Shovelling the coal on to the conveyor belt



The conveyor belt carries the coal to the tubs

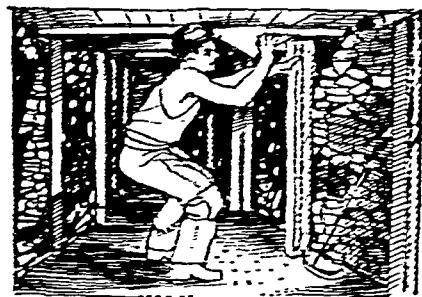


Hauling the tubs to the shaft

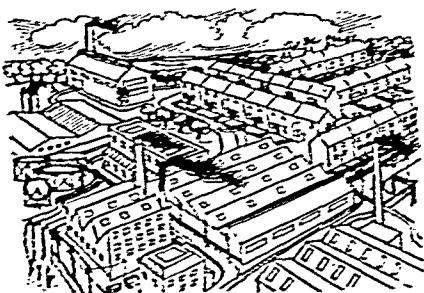
Ted Bates shovels the coal on to a strong moving belt of rubber, called a *conveyer*. This carries the coal to the tubs. A battery locomotive pulls the tubs to the shaft.

As he works, Ted puts timber or steel props to hold up the roof. Later, more permanent supports will be put in their place.

At the pithead the coal is washed, and sorted into sizes by being shaken through *screens* with holes in them.



Putting a wedge on top of a steel prop

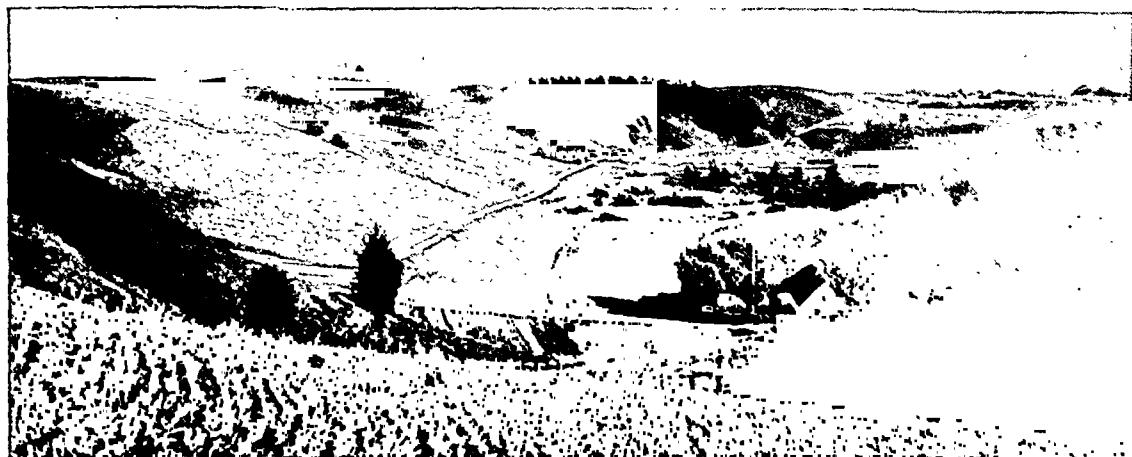


Coal is used to make gas, coke and electricity, as well as to heat our homes. Even now that we have oil and atomic power we cannot manage without coal.

Coal makes gas, coke and electricity for our factories and homes

FOOD FROM DENMARK

Every week we eat butter, bacon, eggs and cheese. These foods may come from farms in Britain, but it is more likely that they come from Australia, New Zealand, Canada, Holland, or Denmark.



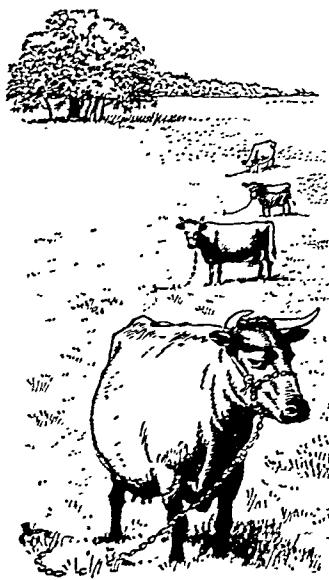
A farm in Denmark

Denmark is a country which is famous for its farms. There the weather is a little hotter in summer, and a little colder in winter, than in Britain.

Most of the farms are small and the farmer needs only his family to help him. He keeps cows, pigs and hens, and to feed them in winter he grows root crops, oats and barley.

The cows graze in the fields during the summer. In winter they live in the cow house. Each farmer has only a few cows. Some are reddish-brown, called Red Danish cows, and others are black and white Jutlands, which give rich milk.

FOOD FROM DENMARK



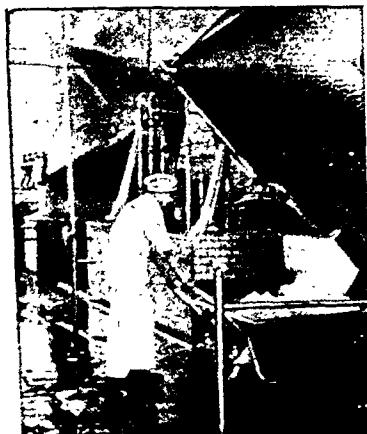
The cows are tethered in the fields

In the fields the cows are tethered so that they cannot trample down the rich grass. The farmer moves them when they have eaten the grass around them.

At milking time the cows are driven into their stalls, or "standings". Each cow has fresh hay and water. The cows are milked by electric milking machines. Many farmers' milk their cows three times a day. The milk is cooled and taken to the village dairy.

The dairy is owned by all the farmers. It is spotlessly clean and has fine modern machinery.

To make butter, the cream is separated from the milk, and then turned round and round in a large stainless steel churn. Some churns make a ton of butter at a time.



Making butter

Rennet is added to some of the milk to make it go sour. Then the whey is drawn off, and the curd is made into cheese. The vat on the right holds over 1,000 gallons of milk. The milk will be made into Danish blue cheese.



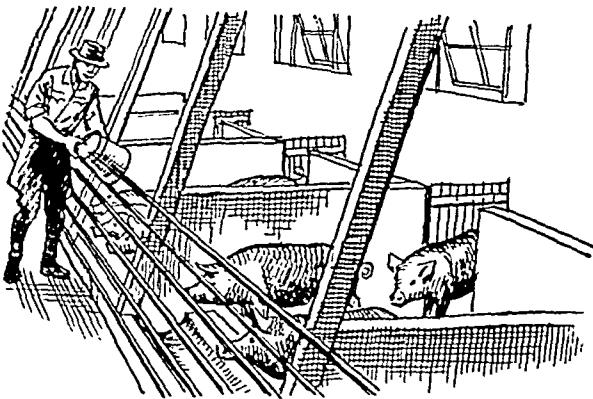
Making cheese

The farmers feed their pigs with skimmed milk. When the pigs are heavy enough, they are killed for bacon. The bacon is "cured" by being put into a brine bath. (Brine is salt water.)



Three sides of bacon

Danish farmers produce far more eggs, bacon, butter and cheese than the Danes can eat. Some of this food goes to Germany, France and Italy, but most of it goes to Britain. In exchange Britain sells coal and iron, tractors and machines, to Denmark.



Feeding the pigs

The farmers' wives usually look after the hens, and feed them with grain grown on the farm. They send the hens' eggs to packing stations. There the eggs are tested by "candling"—holding them over a strong light to see that they are good. Then they are graded in sizes, stamped and packed.

Many Danish chickens are reared for killing and eating. They are plucked and prepared at poultry "dressing" stations. Often there are bedding factories near these stations—can you think why?



360 eggs are packed in each box

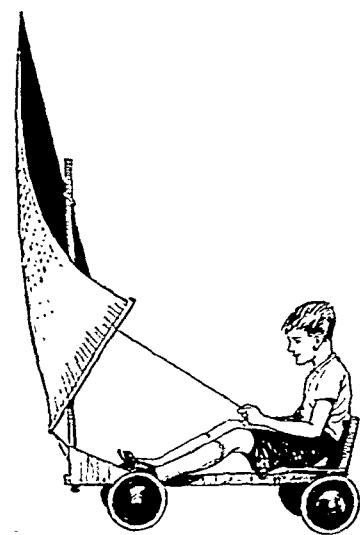
WINDS AND DIRECTIONS

This trolley needs no one to push it. The wind fills its sail and drives it quickly along.

Trees near the sea often have strange shapes because on most days the wind blows in from the sea. A strong wind makes huge waves which crash over the sea wall.



A rough sea on the promenade

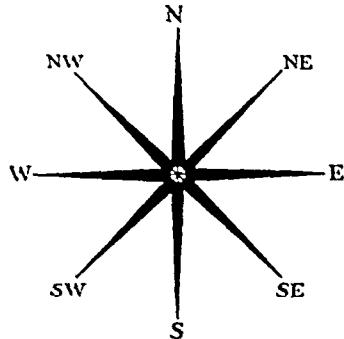


A land yacht

How fast is the wind blowing today? Here is a table which will help you to decide.

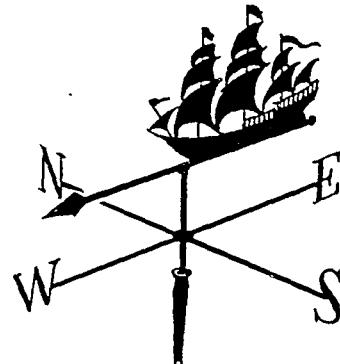
SPEED IN MILES PER HOUR	NAME OF WIND	WHAT WE SEE AND HEAR
0 m.p.h.	calm	smoke rises straight up
5 m.p.h.	light breeze	leaves rustle
20 m.p.h.	fresh breeze	small trees sway
30 m.p.h.	strong wind	telephone wires whistle
50 m.p.h.	gale	chimney pots and slates blown off
60 m.p.h.	strong gale	trees uprooted and houses damaged

The direction of the wind helps us to know what sort of weather to expect. In Britain in the winter, winds from the south and west are warmer than those from the north and east which have been blowing across icy lands and seas.



Eight points of the compass

Look for weather vanes on the tops of high buildings. The arms of the weather vane point north, south, east and west. An arrow above them swings round, and points to where the wind is coming *from*. The weather vane above shows that a west wind is blowing.

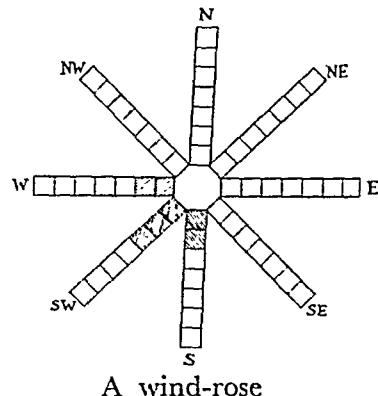


A weather vane

But pilots, sailors and many other people need to know more about wind directions than just north, south, east and west. The direction half-way between south and east is described as south-east. The diagram above shows eight points of the compass. What is the direction half-way between north and west?

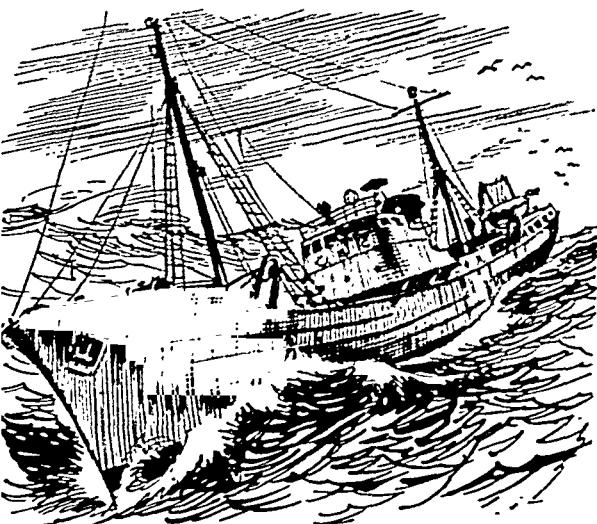
Draw a wind-rose to show which way the wind is blowing. Each day look at the weather vane, and fill in one box to show where the wind is coming *from*.

This wind-rose shows that the wind has blown for two days from the west, for three days from the south-west, and for two days from the south.



A wind-rose

A TRAWLER GOES TO SEA



Here is the *Red Queen* with a rough sea breaking over her. *Crash* goes the wave as it swamps her decks, and the little ship rolls and pitches. She is a trawler from Aberdeen, and now she is far out in the North Sea.

On the mess deck the crew are having a meal. When the ship rolls, the plates cannot slide off the table because they are held by bars of wood. The table is screwed to the floor, and cannot move. The crew sleep in bunks, built one on top of another into the bulkhead, or wall. The bunks have sides, so that the men sleeping in the bunks are not thrown on to the floor in rough weather.

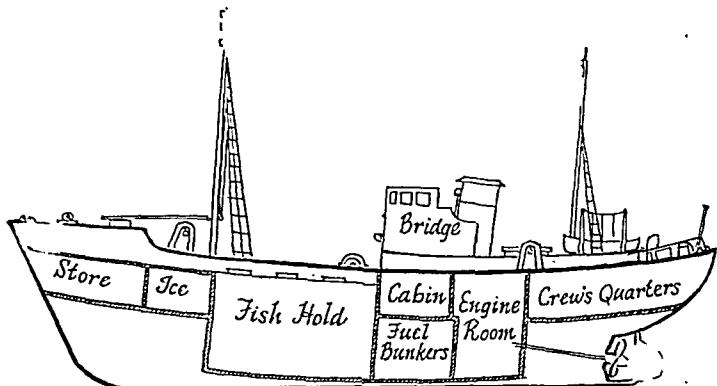


When the ship is out fishing the crew may spend as much as eighteen hours a day on deck. They work in the cold wind and salt spray, catching fish for us to eat.



The crew eat their dinner in two shifts

The *Red Queen* is one hundred feet long, and twenty feet wide. Here you can see the different parts of the ship. There is plenty of space for the fish.



The parts of a trawler

The captain, called the skipper, has to know where to catch the fish, and he has very little rest while the boat is out at sea. There are ten men on board the *Red Queen*.



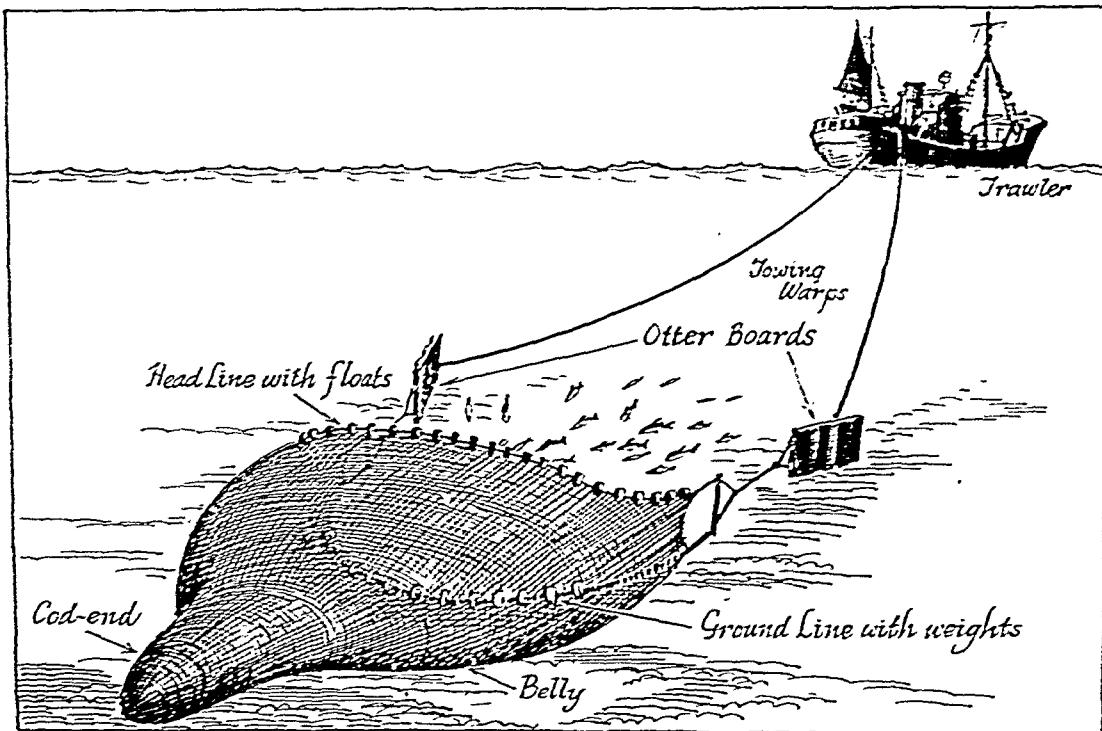
The skipper at the wheel of the *Red Queen*

The cook works hard to prepare enormous meals for the hungry crew.

Mending the nets



A TRAWLER GOES TO SEA

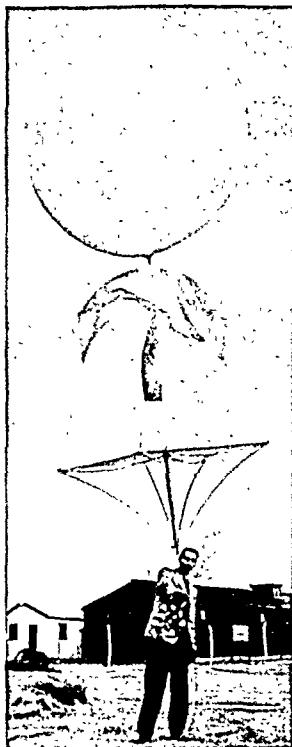


A trawler pulls its net along the bed of the sea

When the *Red Queen* reaches the fishing ground the skipper tells the crew to throw out the trawl. This is a cone-shaped net which is pulled along behind the ship. The bottom of the net is kept down by weights, the top is held up by floats, and the mouth is kept open by otter boards.

For three hours the *Red Queen* pulls the trawl along the bed of the sea. It is a heavy load even for her strong engines. Fish which feed on the bottom of the sea are disturbed by the ground rope. They swim up and pass into the net. Once the fish are in the cod-end they cannot escape.

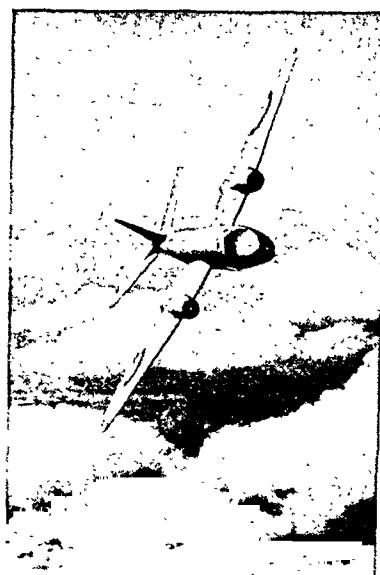
“HERE IS THE WEATHER FORECAST”



Launching a balloon

Red sky at night,
Shepherd's delight.
Red sky at morning,
Shepherd's warning.

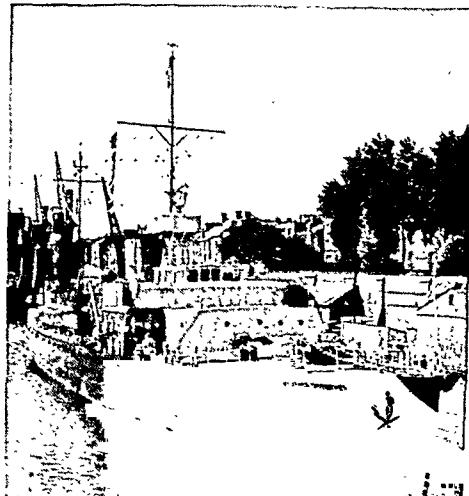
Verses like this were very useful before the B.B.C. began to give us a weather forecast. But now, several times a day, news about the weather is broadcast on the wireless and on television.



Flying above the clouds

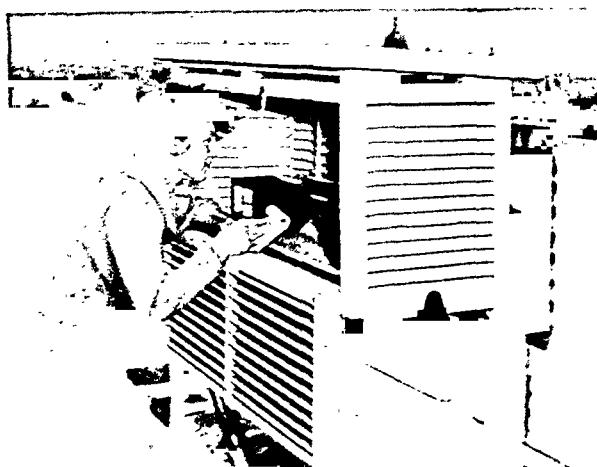
If there is a gale warning, ships can shelter in port. Aeroplanes can fly higher, above the clouds, to avoid bad weather. If frost is likely, market gardeners cover their plants.

The B.B.C. gets its news about the weather from the Central Forecasting Office, which makes the weather forecast. This office collects information from two hundred weather stations in the British Isles, and from “weather ships” far out at sea. They send in reports four times a day. Aeroplanes, and balloons carrying instruments, are sent up to great heights to find out what the weather is like in the upper air.



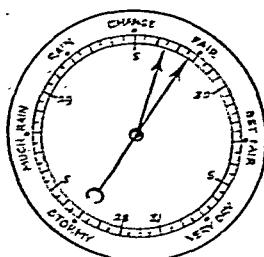
An ocean weather ship

"HERE IS THE WEATHER FORECAST"



Reading instruments on the Air Ministry roof

The instruments are kept in a box, so that the sun cannot shine on them. The box has slatted sides and a double top, and it is painted white.



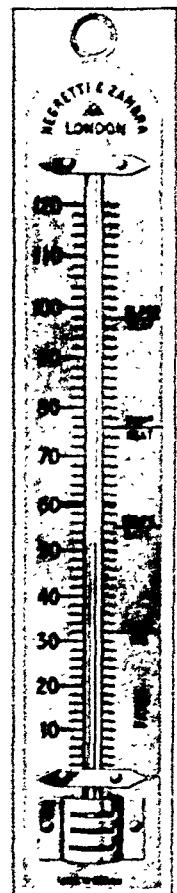
A barometer

This *barometer* tells how heavy the air is. To measure how hot or cold it is, that is to find the temperature, the weather stations use a *thermometer*. You may have a thermometer like this one in your classroom.

On warm days the red liquid in the glass tube *expands*, or grows bigger, and rises up the tube. On cold days it shrinks down the tube.

Temperature is measured in degrees Fahrenheit, written like this: 32° F. Here you see the thermometer at 52° F. If the temperature is below 32° F. the puddles in the road freeze.

The weather stations and ships have special instruments to tell them all about the air,—how heavy it is, how much water it is carrying, how hot or cold it is, and how quickly it is moving.



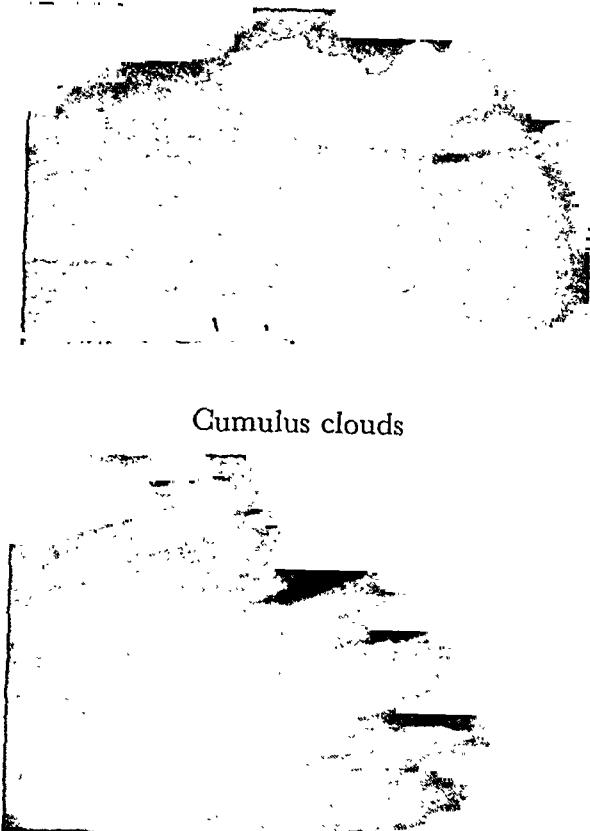
A thermometer

"HERE IS THE WEATHER FORECAST"

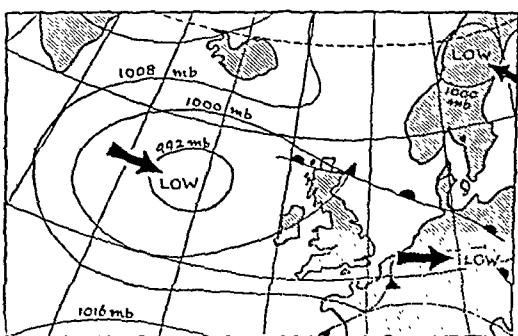
The men at the weather station also look at the clouds. They notice what kind of clouds these are, how high they are, and which way they are moving.

Here are two kinds of clouds which they often see. The fluffy "cotton-wool" clouds are called *cumulus*. The *cirrus* clouds, which look like a white horse's-tail, are often called "mares' tails". They are very high in the sky where it is so cold that they are made of tiny crystals of ice, not water.

Cirrus clouds, called "mares' tails"



Clouds help to tell us about the weather, but we can never make a forecast just by looking at them, so the men and women at the weather stations send reports to the Central Forecasting Office.



A weather map, from a newspaper

Wind, clouds, temperature, pressure—all these and many other details are put on a map of Europe and the Atlantic Ocean. The forecasters compare this map with maps made on earlier days. Then they say what they think the weather will be.

SUGAR FROM THE WEST INDIES



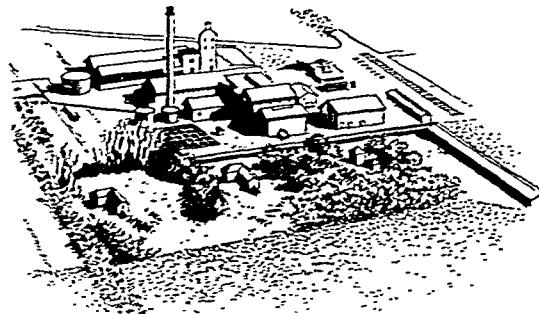
Do you like sweets—toffee, rock, bull's-eyes and peppermints? They are called sweets because they taste sweet. They taste sweet because they are made with sugar. We have sugar on our corn-flakes, and in our tea. Mother uses sugar to make cakes and puddings.

Most of the sugar we use comes from the juice found in the stem of the sugar cane. This cane is a very strong grass, and it grows over ten feet tall. The canes have long spear-shaped leaves, and feathery grey flowers.

Sugar cane will only grow in hot, wet countries such as India, Brazil and the West Indies. Much sugar is grown in Jamaica, one of the islands of the West Indies.

Sugar cane in flower
Jamaica is a
lovely island,
with forests and mountains.
But sometimes there are fierce
hurricanes, and houses and
trees are blown down.

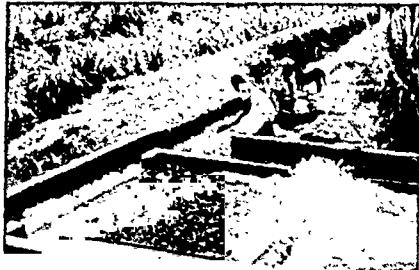
Here is a factory on a sugar
estate in Jamaica. The factory
is in the middle of the cane-
fields.



A sugar factory in Jamaica

Planting a piece of sugar cane

How is sugar grown? First, a short piece of cane, which looks like bamboo, is cut from an old plant. This piece of cane is buried in the ground. New shoots grow up from the joints, and soon a spiky leaf shows through the soil. The hot sun and the rain make the sugar cane grow quickly. Sometimes it will grow as much as an inch in a day.



Water is coming from a main ditch into one of the side ditches

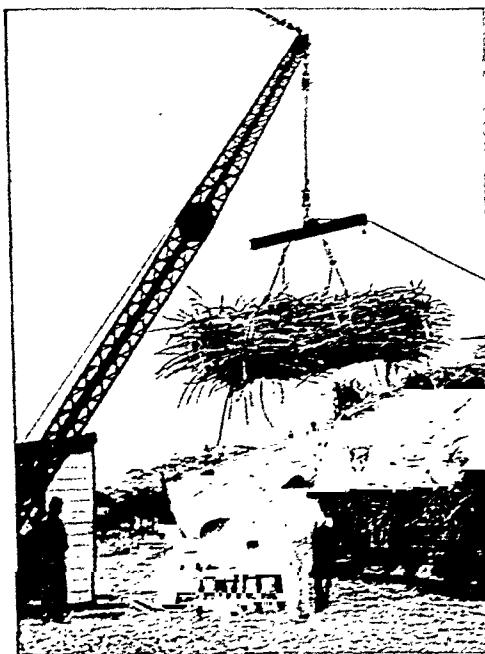
The cane grows for over a year, and when it is ten to fifteen feet high it is ready for cutting. Men use their sharp knives to cut through the cane close to the ground. Then they chop off the green top, and any other leaves that remain.

Cutting the sugar cane



The planter looks after the soil very carefully. Ditches run through his fields (you can see some of the women washing clothes in one of them). If there is too much rain, the planter drains the water away into the ditches. But if there is not enough, he lets in water on to the fields.





A crane lifts the sugar cane from a mule cart into railway wagons

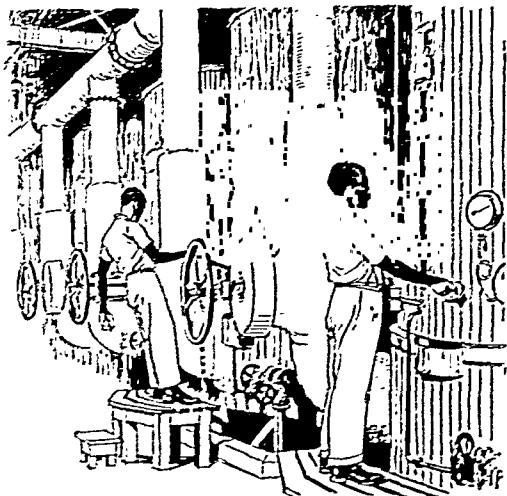
Some of the juice, called molasses, is used to make thick black treacle. The rest of the juice is boiled in huge pans.

As it cools, brown crystals form at the bottom of the pans. The crystals are put into sacks and sent to countries which cannot grow their own sugar cane.

When the sugar arrives in Britain it is taken in barges to the sugar refinery, where it is stored in silos. There are big sugar refineries near the ports of London, Liverpool and Greenock.

It is not easy to cut the canes by machinery because they are so tangled. But on some estates, machines with a grab, like huge hands, tear out the cane.

When all the cane is cut, it is loaded into carts and taken by railway to a factory. Here a machine chops up the canes. Then the canes are crushed between enormous rollers so that every drop of sugar juice is squeezed out.



The boiling pans in a Jamaican sugar factory

Most people in Britain prefer white sugar to brown. So at the refinery most of the sugar is boiled again. As it cools, crystals of sugar appear, sparkling and white. Some of this white sugar is cut into lumps, or made into icing sugar. Sugar can also be obtained from sugar beet, as well as from cane. Sugar beet is a beetroot with a fat white root. It grows well in cool countries, like Britain. Much sugar beet is grown in the east of England, in East Anglia.



“Topping and tailing” sugar beet

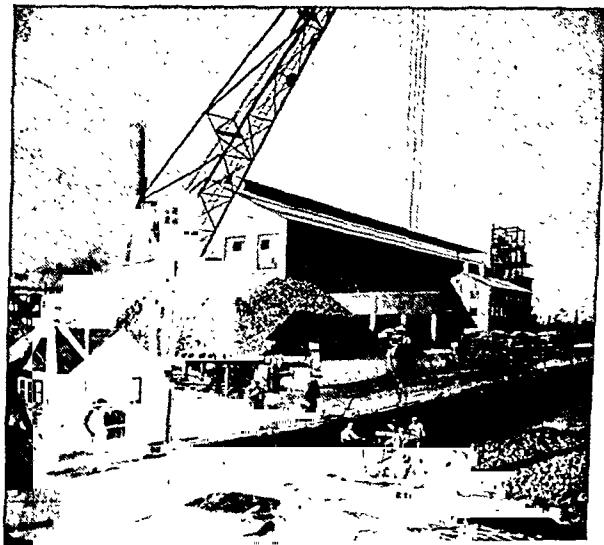
The water is boiled away, and crystals of sugar are left behind. The sugar is packed, and sent to our shops and food factories.

Sugar from beet tastes exactly like sugar from the West Indies. When you buy sugar you cannot tell whether it has come from Jamaica or East Anglia.

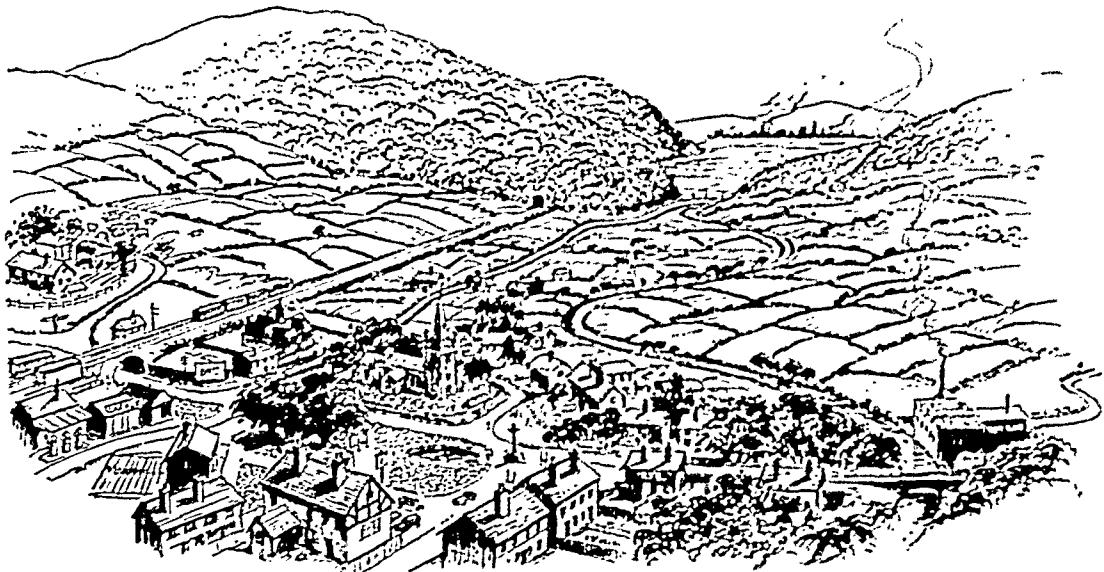


A sugar beet

When the beet are fully grown they are lifted from the soil, and “topped and tailed”. They are taken by lorry or by barge to a factory. There the beet are sliced, and water is run through them many times to draw out the sugar.



Unloading beet from barges at a sugar factory



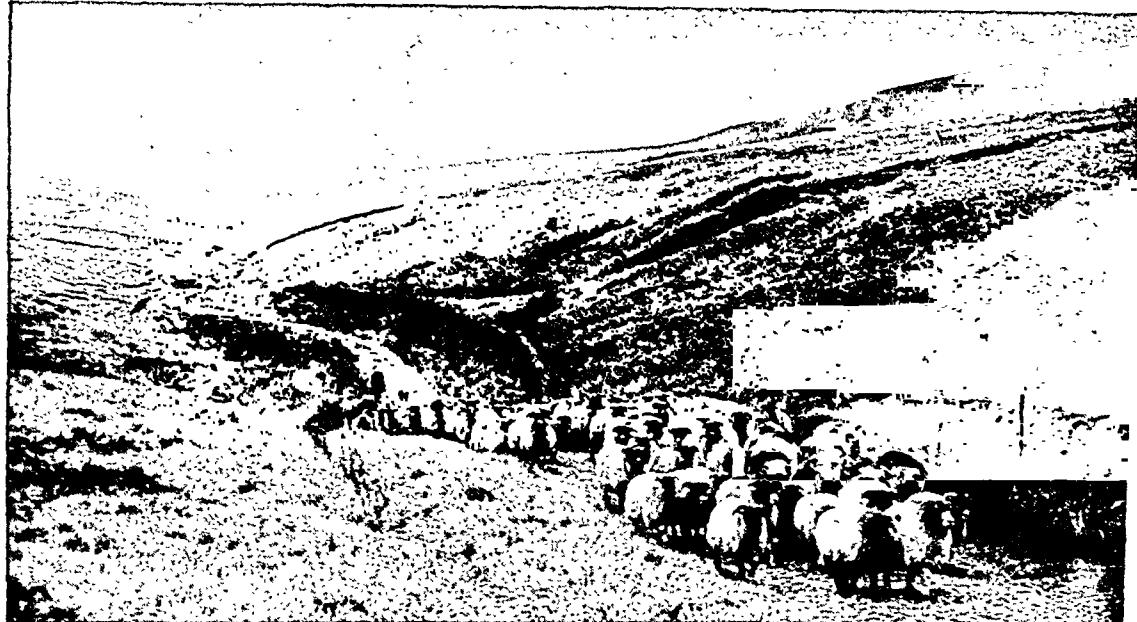
A village in a valley

VALLEY AND HILL

Here is a valley, with a stream running through it. The village has a few houses, a church, a school, one small factory and a little railway station nearby.

Look at the picture carefully, and see how many of these questions you can answer.

1. Where does the water in the stream come from ?
2. Why is the village near the stream ?
3. Why is the factory near the stream ?
4. Why is the village in the valley, and not on top of a hill ?
5. Beyond the railway is a farm. What crops will the farmer grow, and what animals will he keep ?
6. Tom is leaving school and wants to work in the village. How many different jobs can you find for him ?



Moorland in the north of England

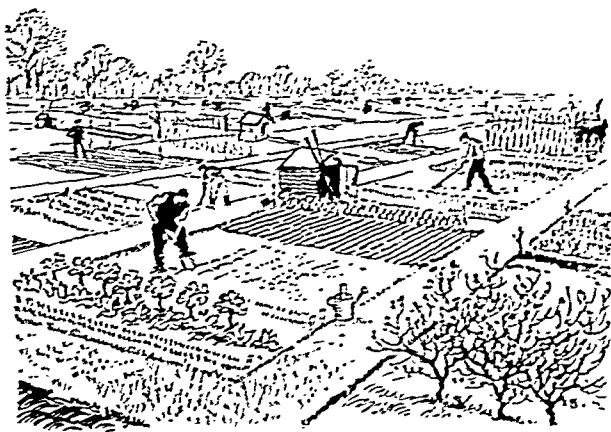
Here is the moorland, high above the valley. Only sheep can live on the short grass, and they have to wander many miles to find enough to eat.

The grass is short, and hedges will not grow, because there is only a little poor soil over hard rock. Instead of hedges there are stone walls, made of stones which were quarried from the hillsides.

In places where the rain cannot soak through the rock, the ground is wet and boggy. In other places, the rain runs off the hillsides to form little streams.

There are few roads over these hills, only paths and sheep tracks. In winter the snow is often so deep that no one can cross the hills.

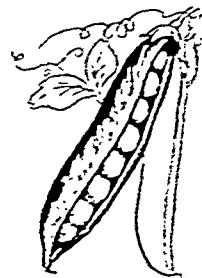
GROWING VEGETABLES IN BRITAIN



Working on the allotment

Mr. Banks sows his first row of peas in March. When the plants are a few inches high he puts in brushwood for them to climb up as they grow.

From July onwards the pods are full and ready to be picked. The pods have as many as nine peas in them, and each plant has many pods.



A pod of peas



Green vegetables are good for the family, so Mr. Banks grows cabbages, cauliflowers and Brussels sprouts. He does not always grow them from seed. Sometimes he buys young plants from the market. Mr. Banks knows that he must water the plants if there is no rain.

The sprouts at the bottom of the stalk are ready first

Leeks, which taste rather like onions, are grown from seeds in frames. (Frames are boxes, covered with glass, which protect the young seedlings.) When the young leek seedlings are about five inches tall, Mr. Banks drops them into a hole made by a "dibber". The part of the leek which is in the hole does not get any light, and so it stays white. That is the best part to eat.



Lifting carrots with a fork



Planting out
leeks with a
"dibber"

Mr. Banks sows his carrot seed in April and "thins" the carrots in May. He thins them by pulling out the smallest carrots where they are crowded. While they are growing, Mr. Banks keeps them free from weeds, and he waters them in dry weather. By September the carrots can be lifted from the ground with a fork.

Mr. Banks grows many other things as well,—lettuces, tomatoes, radishes, onions, parsnips, rhubarb and raspberries. He grows enough potatoes to last several months. All the family help him.

Mrs. Banks likes the fresh fruit and vegetables, and she is glad that they are saving money by growing their own food.

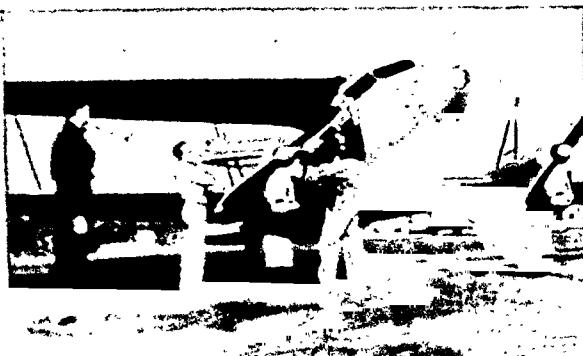


The homestead of a sheep farmer in Australia

WOOL FROM AUSTRALIA

Mr. Driver is a sheep farmer in Australia. Here is his homestead. Nearby are the outhouses—the wool sheds, the garages for the cars and tractors, the stables, the smithy and the houses for the men who work on the farm.

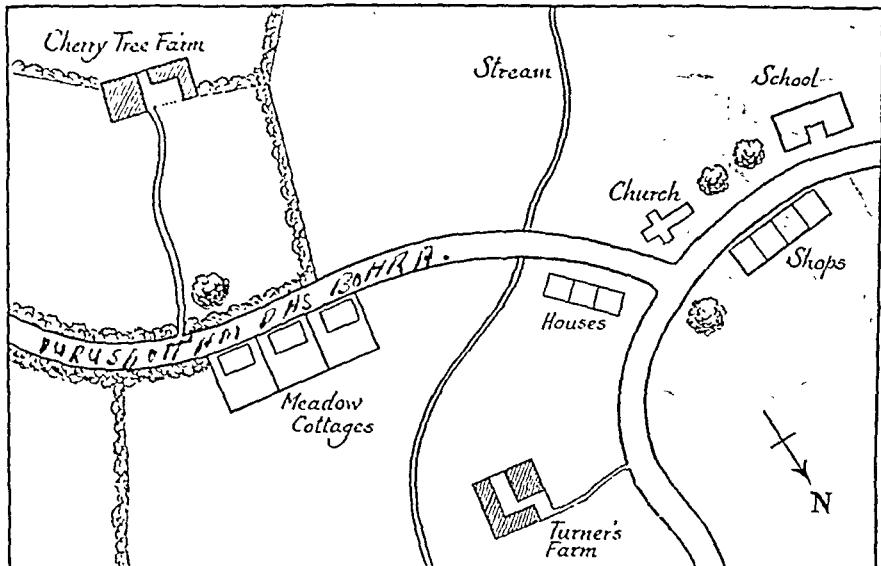
The sheep station, as his farm is called, is very large. It has eight huge fields, called *paddocks*, each larger than a whole farm in England. In each paddock there are thousands of sheep.



Putting a stretcher into the "flying doctor's" plane

The farm is over one hundred miles from the nearest town. Many farmers have wireless transmitters so that they can talk to their friends who live in the district. If any one is very ill, Mr. Driver uses his wireless transmitter to send for a "flying doctor".

LOOKING AT MAPS



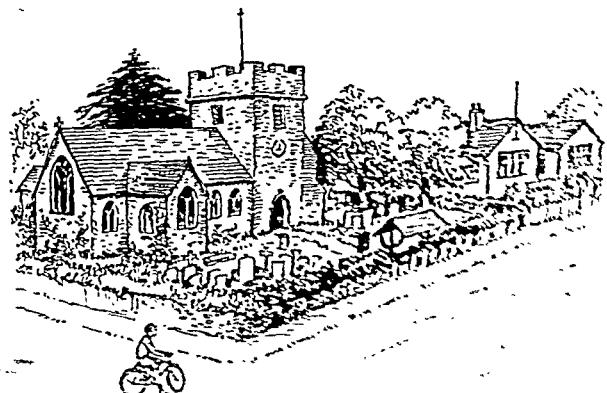
A map of part of Crofton village

This is a map of part of Crofton village. Peter Todd lives at Cherry Tree Farm. When he goes to school he walks down the farm lane and when he reaches the road he turns left.

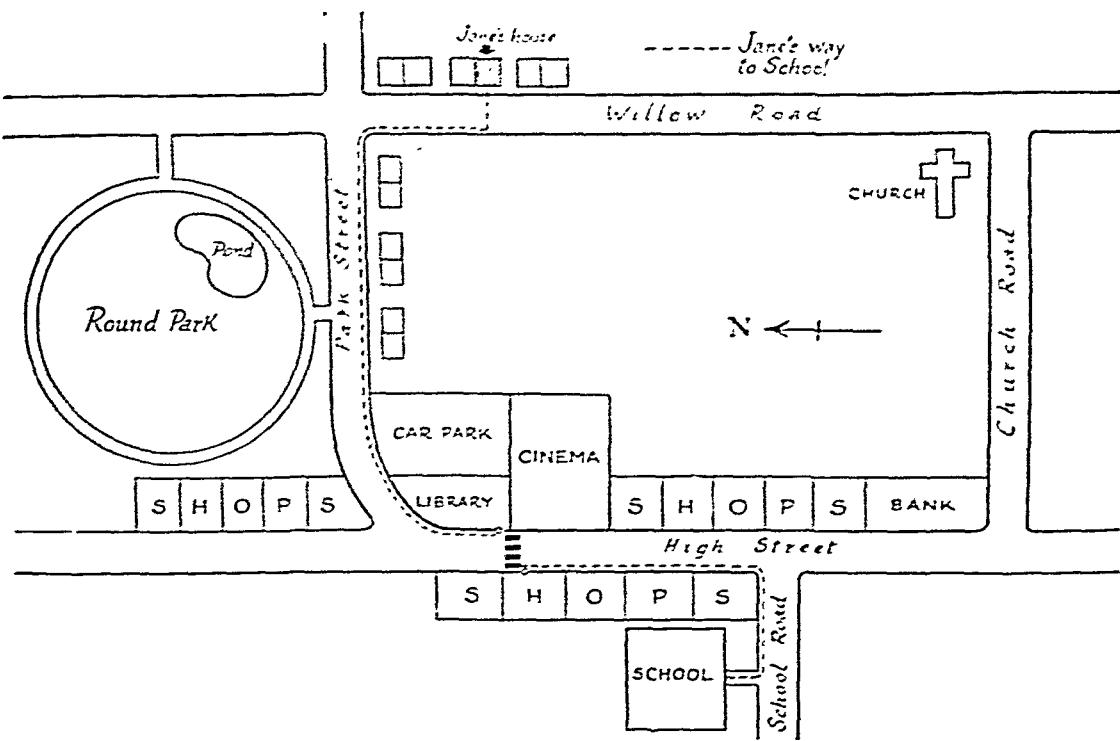
He calls for his friend Robert at Meadow Cottages. They cross the bridge over the stream, turn left at the church, and go into the school playground.

After school, Peter and Robert walk home. What do they see on their way?

Here is Peter on his bicycle. Will he turn right or left to go to the shops?

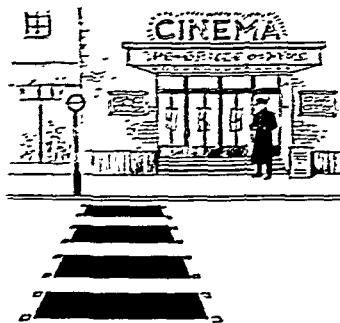


LOOKING AT MAPS

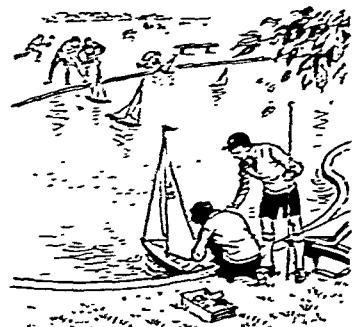


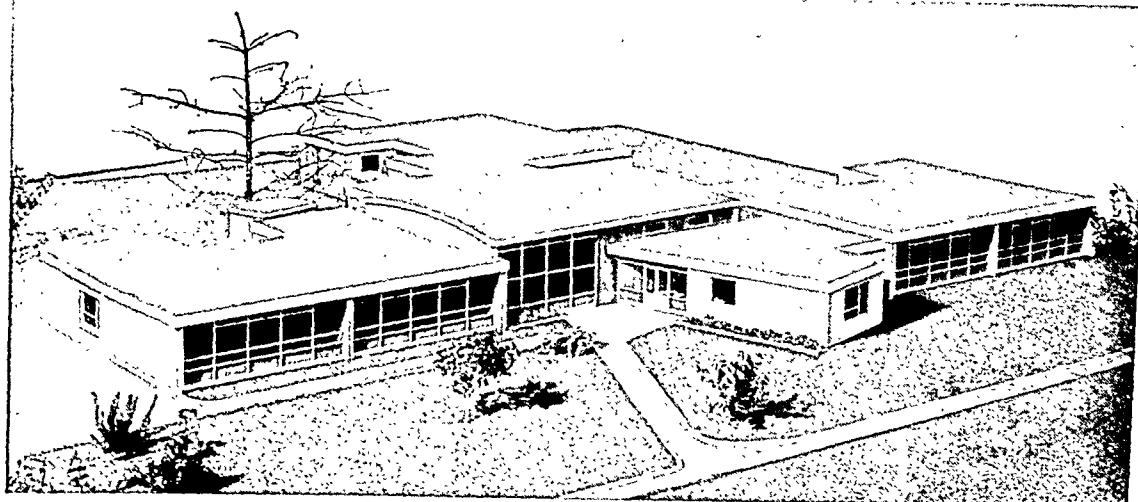
Here is a map of Jane's walk to school. Try to describe the way she goes. Begin: "Jane crosses the road in front of her house, and turns right."

Notice that she crosses the High Street at the Zebra crossing. Describe another way Jane could go to school.



Point to these two places on the map. Is the cinema north or south of the bank? Is Jane's house east or west of the library?



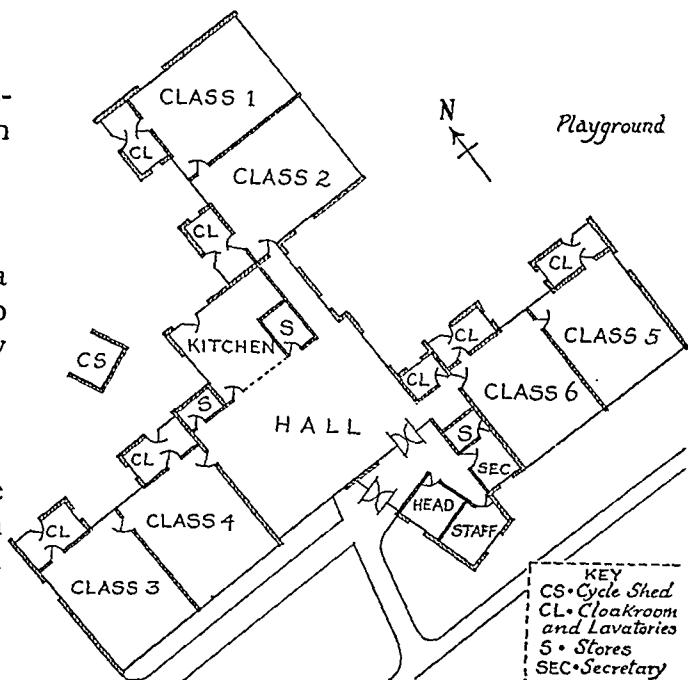


Here is Jane's school. A path leads up to the main door, which is painted white. Just to the left of the door are the big windows of the hall.

The school has only six classrooms. You can see them on this plan.

One day Jane has to take a book from classroom 6 to classroom 3. Find out exactly which way she goes.

Jane finds a visitor in the school playground. Which way does she go to take him to the headmaster?



TEA FROM CEYLON



In Queen Anne's reign

These ladies of Queen Anne's reign are drinking "tay" or tea. It cost forty shillings a pound, yet they were never sure of the best way to make it. Sometimes they boiled the tea, threw away the liquid, and ate the leaves. At other times they made their tea and kept it in barrels like beer.

In Queen Anne's days all our tea came from China. Today tea is also grown in India, and Ceylon, in Pakistan and East Africa. Nearly everyone in Britain drinks several cups of tea every day. If we shared out all the tea used in Britain in a year, every man, woman and child would have forty quarter-pound packets.



A tea plantation in Ceylon. The women are picking the leaves from the tea bushes on the hillsides.

Here is a tea plantation in Ceylon. On the hillsides the flat-topped tea bushes are growing. Brown-skinned women are picking the leaves from the tea bushes. Near-by is the factory where the leaves are taken.

The seeds of the tea plant are sown in sheltered nursery beds. Holes are pricked in the soil and the seeds are dropped into them. Fourteen months later, when the seedlings are eight inches tall, they are planted out on the hillsides.

Planting tea seeds



Tea plants like rain, but they do not grow well if water collects round their roots. They grow best on the hillsides, where the water drains away.

The tea plants grow all the year round : they are evergreens. If they were allowed to grow fully, they would be nearly thirty feet tall. But they are pruned, so that the bushes are kept down to three to four feet high, with flat tops.

While the bushes are growing, the soil between the rows is hoed regularly to kill the weeds.

Pruning a tea bush



The families which work on the tea estates live in small houses, built close together.

Because the sun is so hot, many of the houses in Ceylon have stone walls with very few windows. To provide shade they have overhanging roofs.



Houses of the workers on the tea estate



A tea plucker

They throw the tea into the baskets on their backs. As each basket is filled, the plucker takes it to the roadside to be weighed. A skilful plucker can harvest fifty pounds of green leaf in one day.

When the tea has been weighed, it is taken to the factory.



Inside the factory the tea leaves are spread on racks made of sacking. Here they are left to dry for a day. Then the leaves are put in a rolling mill, to release the juices in them. A drying machine turns them into the small, black tea leaves which we know. The leaves are sorted, according to size, by sieves.

The sizes have such names as Orange Pekoe, Broken Pekoe, Fannings and Dust. Spreading the tea to dry on withering racks

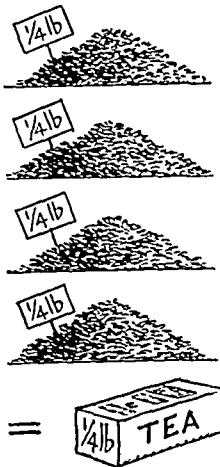
Most of the workers on the tea estates are Tamils, from southern India. They earn far more in Ceylon than they could in their own villages in India.

When the tea bushes are about four years old, the fresh shoots are ready for plucking. In Ceylon, which is near the equator, plucking goes on all the year round. The pluckers are women. Their hands dart quickly over the bushes, nipping off the young leaves and buds.



The plucker takes two leaves and a bud

The tea is packed in plywood boxes, called tea chests. Each chest is lined with aluminium paper to keep out the damp, and holds about a hundred pounds of tea. Ships take the chests of tea to countries all over the world. When the chests arrive at the docks they are unloaded and stored in warehouses.



1lb. of green leaves, when dried, makes $\frac{1}{4}$ lb. of tea

When the tea has been blended it is put into the small packets which we see in our shops.



Lowering tea into a ship's hold

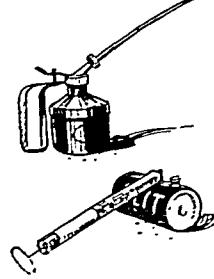
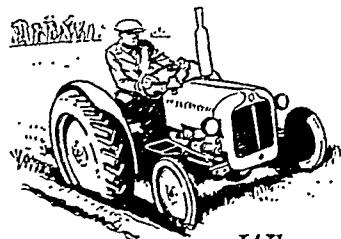
The tea is sold by auction. All the merchants bid for the tea, saying how much they will pay for it. The one who bids the most money buys the tea.

But before the merchant buys the tea, it has to be tasted. The taster makes a pot of tea from each kind of leaf. After six minutes he tastes some on a spoon. He says how it can best be mixed, or blended, with other teas.



A tea taster

OIL FROM ARABIA



What makes them go? All these things, which we see nearly every day, need oil to make them work. There are many kinds of oil : petrol is one kind, and paraffin is another. So it is oil which drives tractors, aeroplanes, diesel trains and cars. We use oil when we "oil" our bicycles, and oil is used to make insect killers and paints.

How was oil formed? No one is certain. Do you remember how coal was made ? Oil was probably made in a similar way. Millions of years ago many sea creatures died, sank, and were buried by mud. The sea creatures were pressed together until the mud became rock, and the creatures became thick, greeny-black oil.

Another name for oil is *petroleum* which means "oil from rock". The layers of rock hold the oil, rather like a sponge holding water. Oil is often trapped by *impervious* rock above it, and cannot escape, even though there may be gas and water with the oil which are trying to force the oil out.

Underground rock, filled with oil

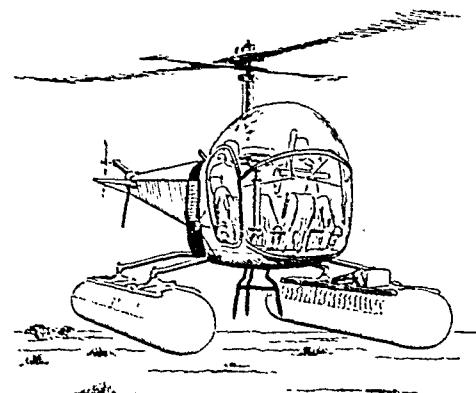


How is oil found? In the early days of the oil industry, about a hundred years ago, many wells were drilled in places which could never produce oil. Nowadays a very careful search is made before drilling begins. Men called geologists try to find places where there may be oil.



A geologist takes a rock sample

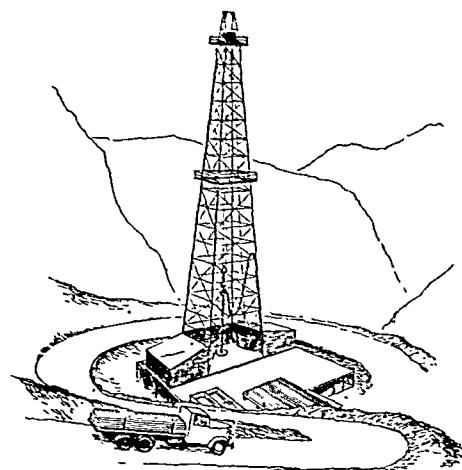
Before an oil well can be drilled there is often a great deal of work to be done, preparing the site. Nearly always a road must be made. Often a swamp has to be drained. When this has been done, a derrick is built. This is a tower, about 160 feet high, which holds the top of the drill pipe. The bit—the part which bites into the ground—is made of very hard steel.



A helicopter carrying geologists

Sometimes helicopters are used in the search for oil. They carry instruments which show whether the rocks may contain oil. (This helicopter has floats for landing on swampy ground.)

Geologists chip samples from the rocks, and try to find out whether there *could* be oil underground. But the only way they can be certain that there is oil, is to drill for it.



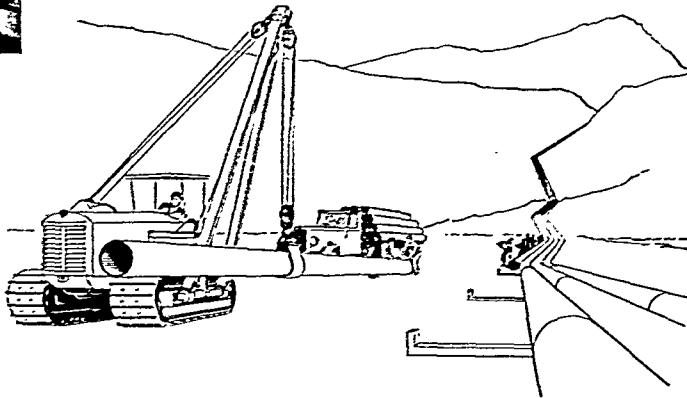
A tall steel derrick holds the drill



Lowering the drilling bit

From the well the crude oil is pumped into storage tanks. Then it is pumped through pipelines to the ports.

The drill pipe is turned by an engine. As it goes round and round the teeth of the bit cut through the rock, and the hole becomes deeper and deeper. Some wells are more than three miles deep. When the oil is reached, the gas and water usually try to force their way out, so pushing the oil up to the surface. In some wells the oil has to be pumped out.



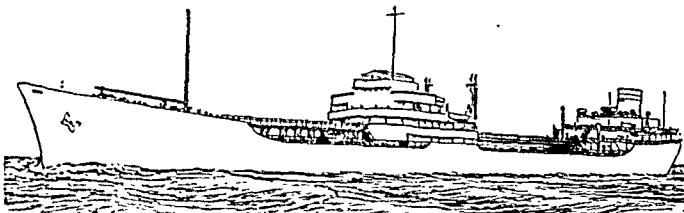
Laying a pipeline in the desert

Oil is used all over the world. Most of the world's oil comes from the U.S.A., Venezuela, Russia, and the Middle East. Oil is often found in very poor countries—round the Persian Gulf, for example. In these countries the oil companies build houses, hospitals and schools.

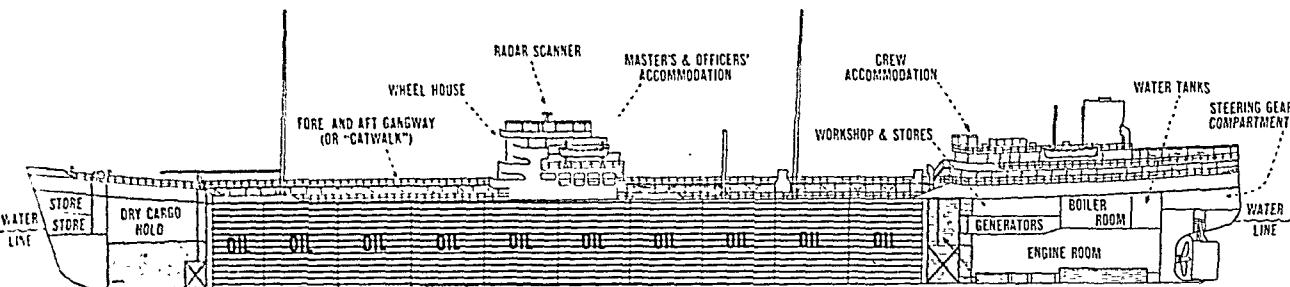


The doctor examines a child at a hospital built by the oil company

Special ships, called oil tankers, bring the oil to this country. They have many tanks to hold the oil.



An oil tanker



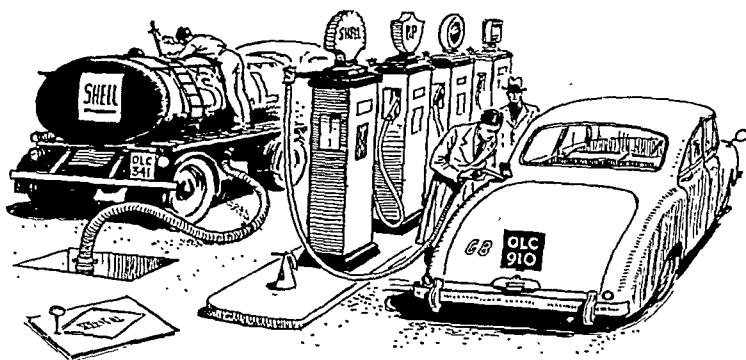
The parts of an oil tanker



Part of an oil refinery

Road tankers carry the different oils from the refinery to our factories, garages and shops.

The road tanker delivers petrol into a big underground tank at the garage





DO YOU REMEMBER PART 2?

Susan has come home from school, and is having her tea. Mrs. Bell is getting supper ready for the rest of the family who come home later. In the kitchen you can see some of the food which Mrs. Bell has bought this week.

Make a list of all the different foods you can see. (There are more than twenty altogether.) Some of them come from our country, others come from countries in various parts of the world. Against each food, write down the names of the countries it comes from, like this :

Butter comes from Denmark, New Zealand and . . .

Suppose you are a man who grows or makes one of these foods, or a fisherman. Describe a day in your life.



ACKNOWLEDGEMENTS

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Some of the drawings on pages 215-219 are from *Deep Sea Fishing* by John M. Wright, and on page 217 from *Lobster and Crab Fishing* by W. S. Forsyth.

The pig diagram on page 213 is reproduced by kind permission of the Editor, from *Progress* the Unilever magazine.

CONTENTS OF PART 3

	PAGE
About Part 3	148
1. Map Making	149
2. A Town and its Services	154
OUR FACTORIES	
3. Power for our Factories and Homes	161
4. Iron and Steel	166
5. Building a Ship	169
6. Making Cars	173
7. Building Aircraft	176
<i>Textiles</i>	8. Wool
	178
	9. Cotton
	182
	10. Some other Textiles
	185
	11. Making Clothes
	186
12. Making Pottery	187
13. Britain's Industry	190
14. Buying and Selling	192
15. Day, Night and the Seasons	194
16. Britain's Weather	197
FARMING AND FISHING	
17. A Dairy Farm in Cheshire	200
18. A Fruit Farm in Kent	203
19. A Market Garden in Bedfordshire	207
20. A Mixed Farm in East Lothian	210
21. Some other Farms	214
22. Fishing	215
TRANSPORT	
23. Transport and Travel by Road	220
24. British Railways	223
25. Air Travel and Transport	227
26. The Regions of Britain	230
Let's Remember Part 3	230



30

ABOUT PART 3

This part is about life and work in Britain. It tells you about some of the people of England, Scotland, Wales and Northern Ireland, and shows you the places where they live.

Some of these people live in towns and cities, and work in factories and offices. Some live in the country and work on farms. Some live near the coast, and work as fishermen, or they load and unload ships at the great ports.

As well as telling you about people and places, this part also shows you how maps are made, and it tells you about the weather and the seasons.

1. MAP MAKING

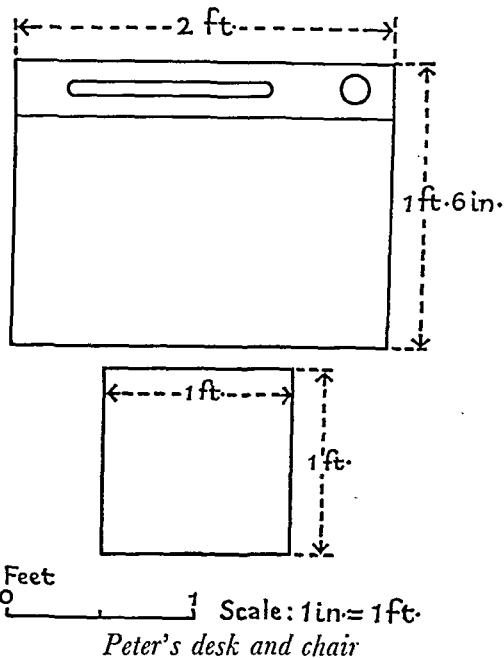
Making a plan of a chair

Peter's chair has a seat which is one foot square : each side of the seat is one foot long. The seat is too large to be drawn full-size on a small sheet of paper, but this drawing shows what it looks like when seen from above. In the drawing the sides of the seat are 1 inch long. We call this a scale of 1 in. = 1 ft.

Using the same scale, the desk has been drawn 2 in. wide and $1\frac{1}{2}$ in. from front to back. What size is the desk top in fact?

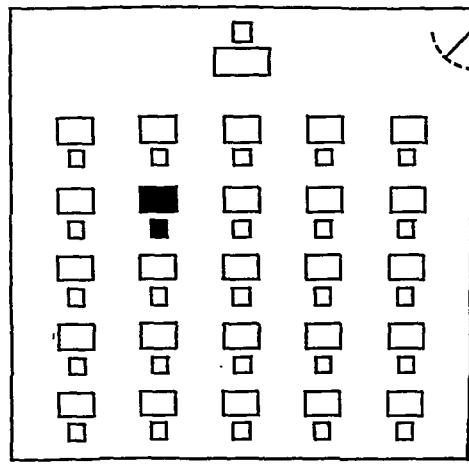
Making a plan of a classroom

When Peter wants to draw a scale plan of his classroom he finds that the same scale (1 in. = 1 ft.) is much too large. Instead he chooses a scale of 1 in. = 10 ft.

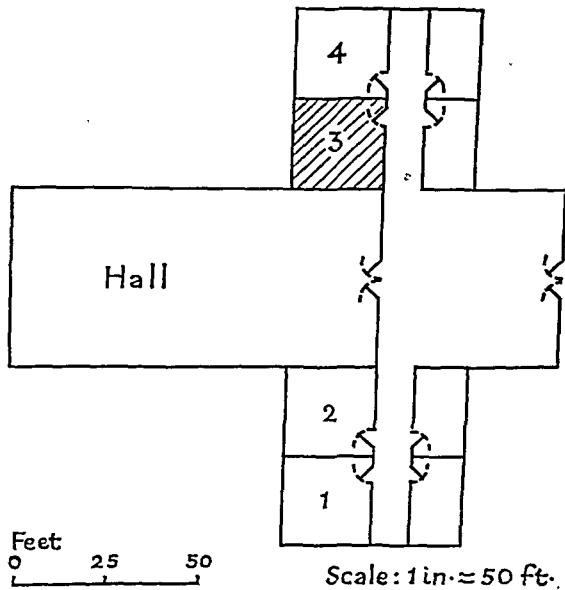


Making a plan of a school

To draw a plan of his school Peter chooses a scale of 1 in. = 50 ft.



Peter's classroom, with his desk and chair shaded in black



Peter's school, with his classroom shaded

Making a map of a small area

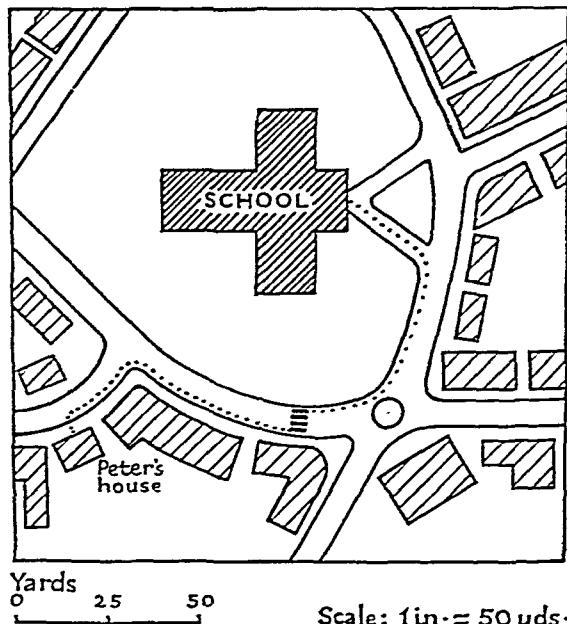
Peter lives near to the school. When he drew this map of his route to school, he chose a scale of 1 in. = 50 yds.

Making a map of a large area

When Peter wants to explore the country around his home he uses a map with a scale of 1 in. = 1 mile. This map shows roads, tracks and footpaths, but it does not show every separate house in the town.

Cyclists often use maps with a scale of $\frac{1}{2}$ in. = 1 mile, (1 in. = 2 miles). Car drivers often use maps with a scale of 1 in. = 10 miles.

The larger the area which you want to put on a map, the smaller the scale must be.



Peter's walk to school

A SEASIDE TOWN



The Bathing Pool and beach at Margate, in Kent

Here is part of a seaside town, Margate. The Bathing Pool was made by enclosing part of the beach. The large building on the beach is the Marine Pavilion, where teas and ices are served. The dark road behind the beach is the Marine Terrace. This picture was taken in the morning, before the car park was full.

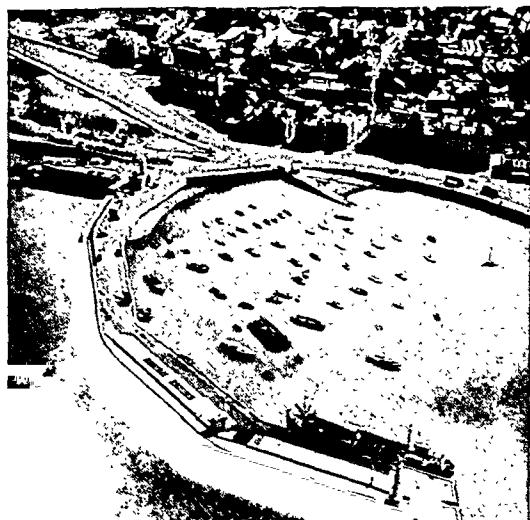
This map shows the Bathing Pool and Marine Pavilion. It also shows some of the houses and other buildings on the promenade.

The map is drawn to a scale of 25 in.=1 mile (1 inch represents about 70 yards). Notice that on a map of this scale, the shape of every building is shown.

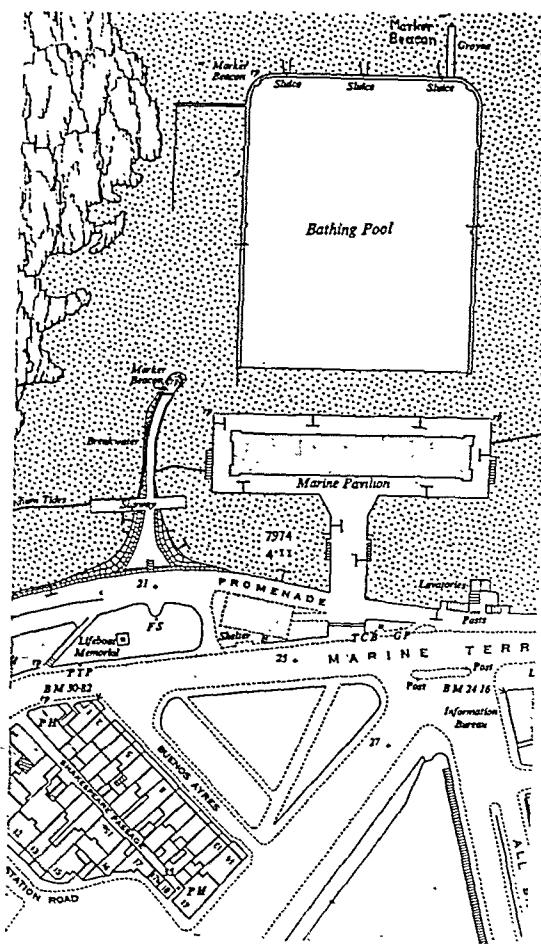
Maps are usually drawn with north at the top. The photograph on page 150 was taken by a camera looking south-east.

How many things can you find on this map which tell you that it shows part of a seaside town?

At the corner of the Information Bureau is an arrow, with a sign "BM 24.16". This is a Bench Mark, and it shows that this point is just over 24 feet above sea level.



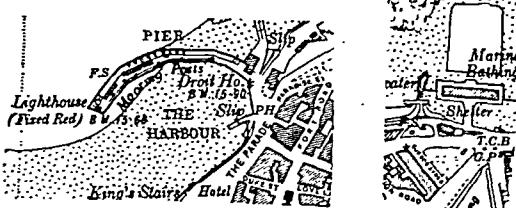
The harbour

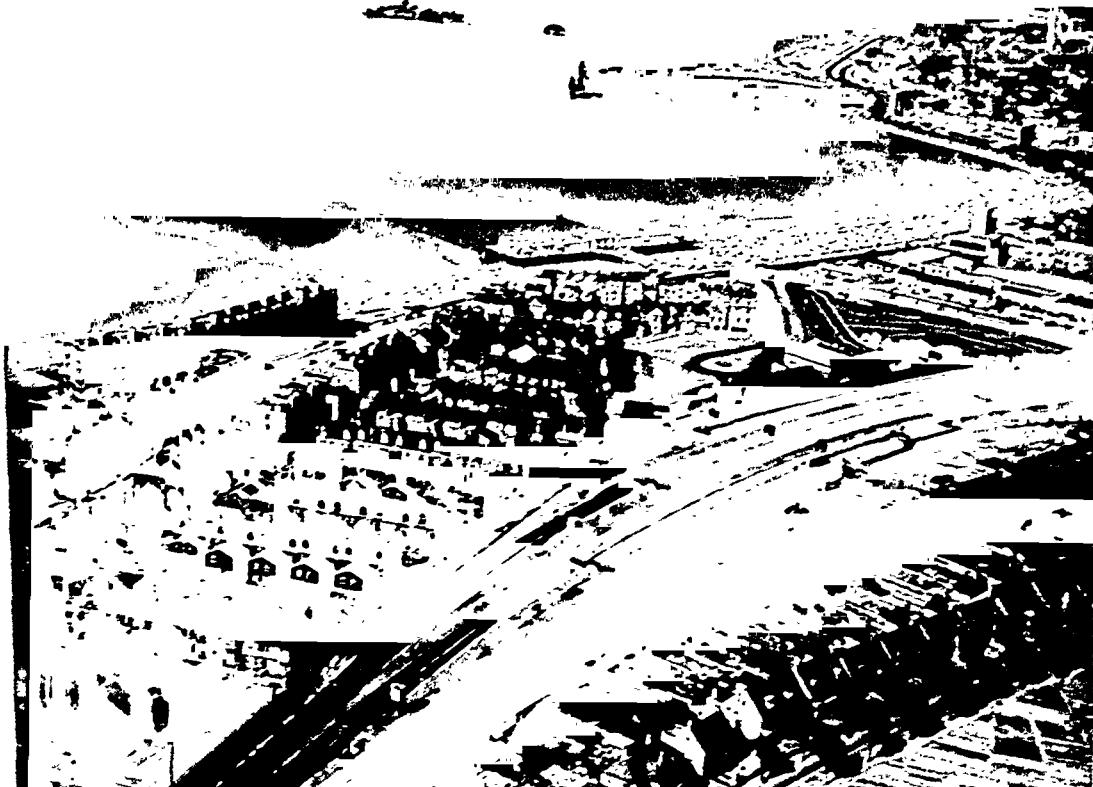


Crown Copyright reserved.

Part of Margate (Scale 25 in.=1 mile)

The little map below (right) shows the same part of Margate as the map above. But this map has a scale of 6 in. = 1 mile (1 inch represents about 290 yards). The harbour map also has a scale of 6 in. = 1 mile.





Margate, looking over the railway station to the Bathing Pool, Harbour and Pier

This photograph of Margate was taken from an aeroplane flying towards the north-east. You can see the Bathing Pool, and behind it the Harbour and Pier. Half-way along the Pier is a white house where the lifeboat is kept.

On the left of the picture are several rows of houses. Behind them, near the sea, is a tall row of hotels and boarding houses.

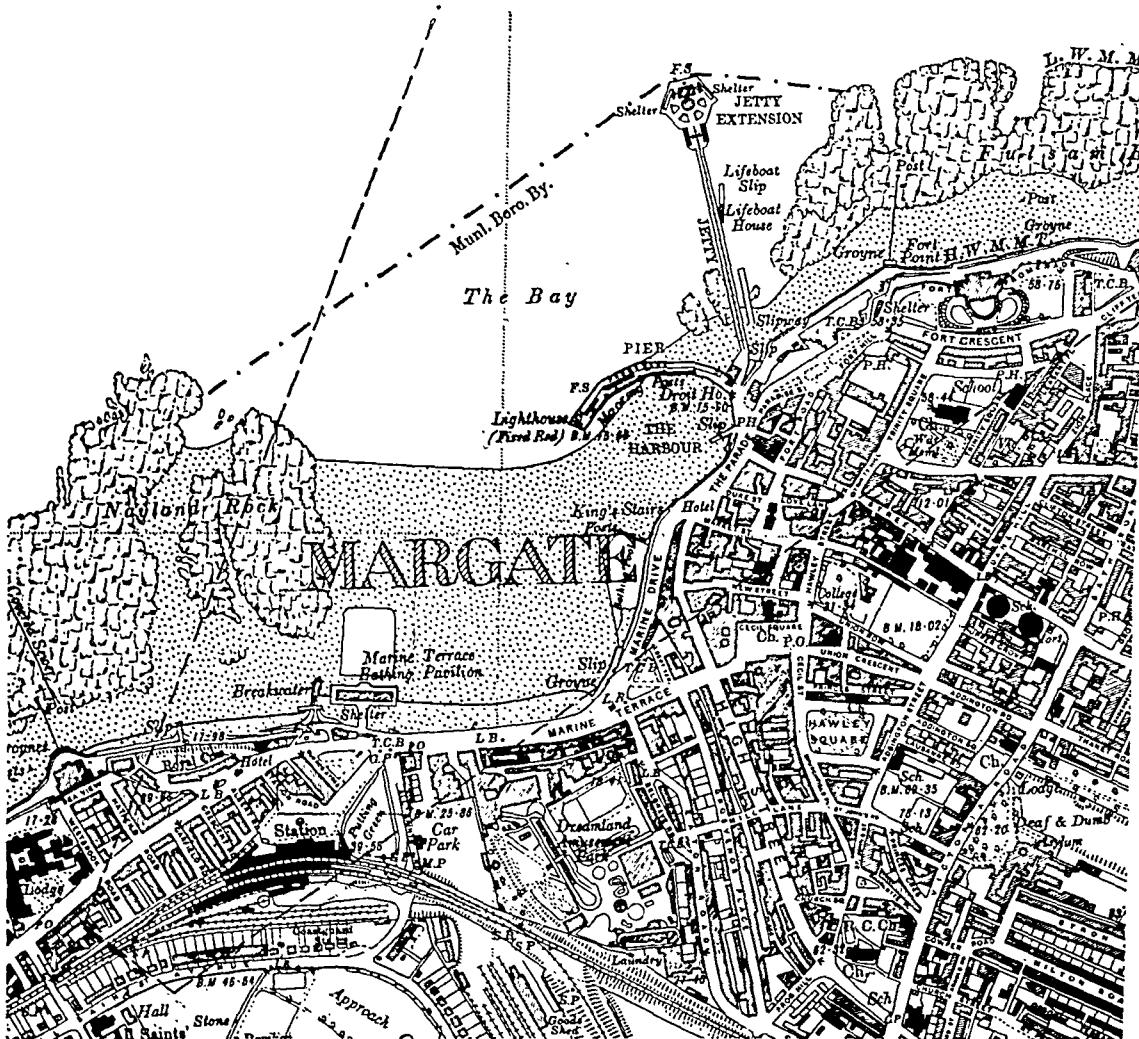
In the front of the picture is the railway station.

At the top of the opposite page is a map of Margate (scale 6 in. = 1 mile). The dashed lines (— — —) show the part of the map which is shown in the photograph.

Find the Bathing Pool, the Harbour, and the Pier with its Lifeboat House.

Find the railway station, and the names of some of the roads near the station.

What would you see on a walk from the station to the Harbour?



Reproduced from the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office. Crown Copyright reserved.

A map of Margate (Scale 6 in. = 1 mile)

Margate is in the county of Kent. A map which shows the whole of Kent must be on a small scale. This

map of Kent has a scale of 1 in. = 30 miles. Margate is shown as a small dot.

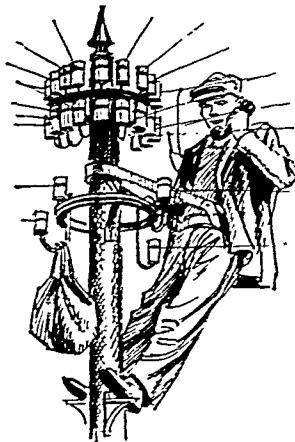
A map which shows the whole of Britain must be on a very small scale. This map of Britain has a scale of 1 in. = 300 miles.



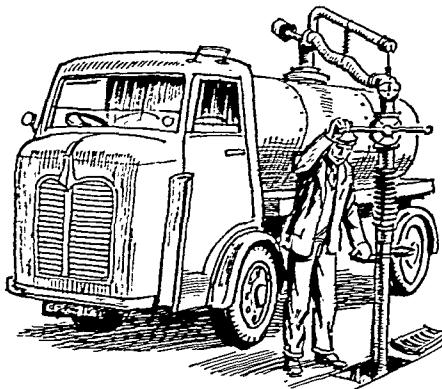
A map of Kent (Scale 1 in. = 30 miles)



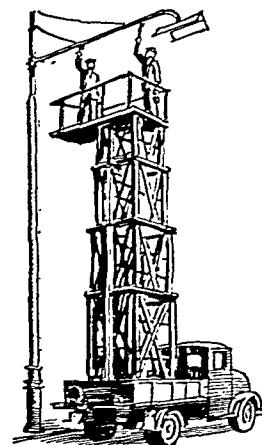
A map of Britain
Scale 1 in. = 300 miles



Testing a telephone line



Cleaning a street drain



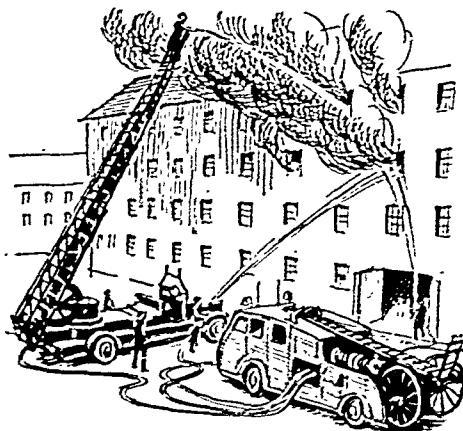
Painting a street lamp

Many people work to provide the services which are needed in a civilised country. You can see some of them on this page, and in the coloured picture which is facing page 161.

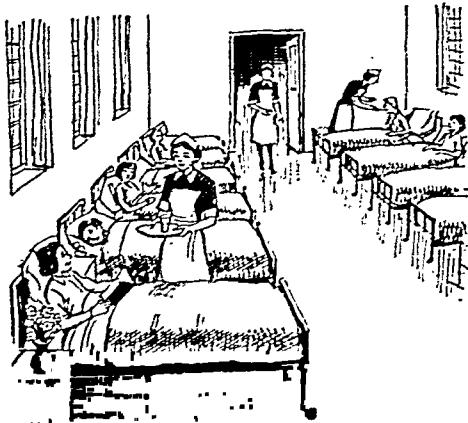
2. A TOWN AND ITS SERVICES

Besides the many workers who *make* things—things like shoes, tables, motor-cars and peppermints—there are many who *do* things instead—firemen, office workers, policemen and rat-catchers. A surprising number of people provide services, instead of making things.

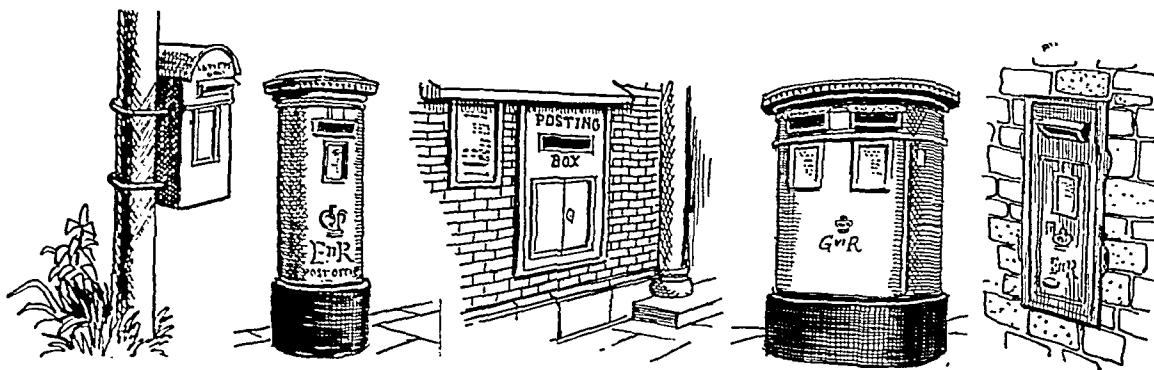
A civilised country must have many of these services, such as the police force, public transport, libraries and gasworks, if life is to go on safely and comfortably for its citizens. Every day postmen deliver letters, water flows from the kitchen tap, and dustmen empty the dustbins. How do these *services* work?



Fighting a fire

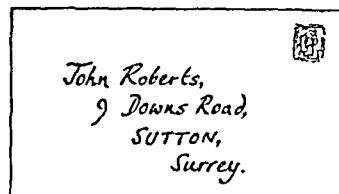


A ward in a hospital



Five different kinds of letter-box

THE POST



Posting a letter

This letter is being posted at a post-box in Devon. Many people will read the address before the letter finally reaches John Roberts. Notice that the sender has written the name of the county as well as the town. He did this because there are other places in Britain called Sutton. There is Sutton in Norfolk, Sutton in Kent as well as eighteen other Suttons !

At the sorting office

Postmen in vans collect the letters from the letter-boxes and take them to the local sorting office.

There the letters are tipped out on to long tables and "faced" so that the stamps are all behind one another. The letters are put through a machine which cancels 600 letters a minute by printing a postmark

over each stamp. The postmark usually gives the name of the sorting office, the date and the time.

Then the letters are sorted. The sorters stand at a table and very quickly pop each letter into its "pigeon-hole", a box marked LEEDS, SURREY, NORTH WALES and so on. One box is for overseas letters. The letters are tied in bundles, labelled, and dropped into mailbags. Each bag is carefully sealed before it leaves the sorting office.

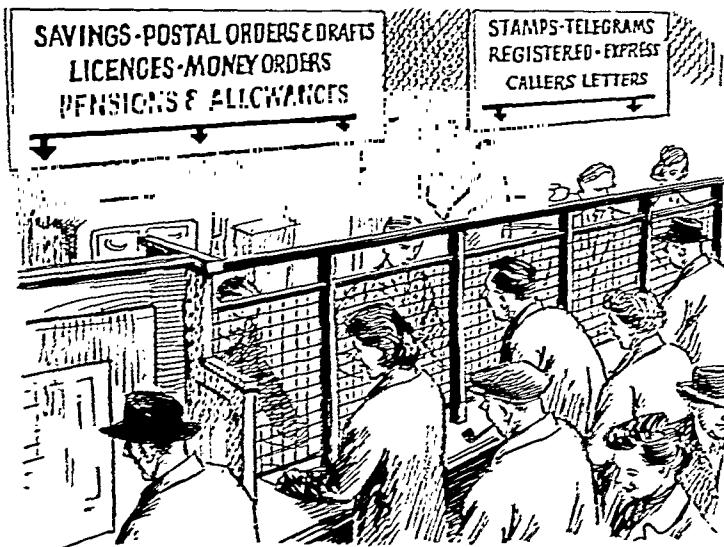


Sorting letters according to the different parts of the country to which they will be delivered

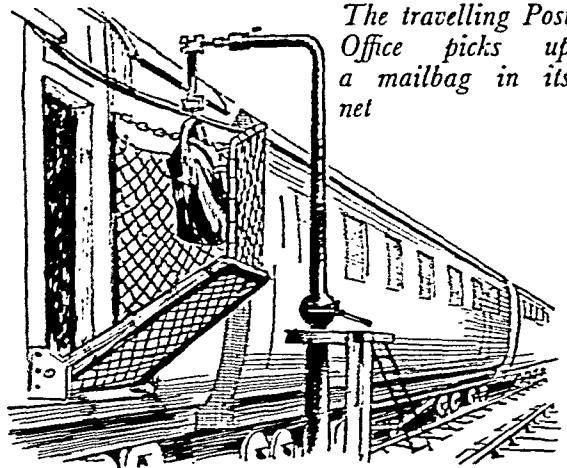
Delivering the mail

Post Office vans take the bags of mail from the sorting office to the railway station, where they are put on to fast trains. In London so many letters and parcels are posted and received that the Post Office has its own narrow-gauge underground railway between the large sorting offices and the main line railway stations.

Some trains have a Travelling Post Office, which is a sorting office in a railway coach. Mailbags are picked up by these trains while travelling at full speed. A net on the side of the coach catches the leather mail bag which is hanging from a metal arm alongside the track. Bags are dropped in a similar way.



The counter at a busy Post Office



The travelling Post Office picks up a mailbag in its net

When the mailbags are unloaded at the railway stations they are taken by van to the local sorting offices. There the letters are sorted into the roads and house numbers, so that the postmen waste no time in doubling to and fro when they are delivering the letters.

Many letters are sent to other countries. People who want their letters to travel quickly send them by air. Special lightweight air letter forms are sold at Post Offices.

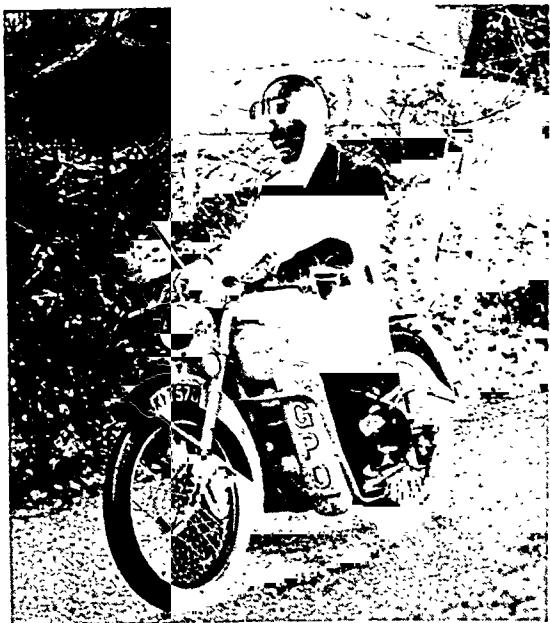
At the Post Office

You know that you can buy stamps at a Post Office counter. But do you know how many other things can be done there? Look at the list at the top of the next page.

Here are some things which people can do at a post Office :

- Buy Premium Savings Bonds.
- National Savings Stamps.
- a Dog Licence.
- a Gun Licence.
- a Radio or T.V. Licence.
- Postal Orders, Money Orders.
- Renew a Car Licence.
- Bank money in the Savings Bank.
- Draw Old-Age Pensions.
- Family Allowances.
- Pay a telephone bill.
- Send a telegram.
- Post a parcel.

From this list alone, you can see that the Post Office provides a very useful service for the public.



Delivering a telegram

DUSTMEN AT WORK

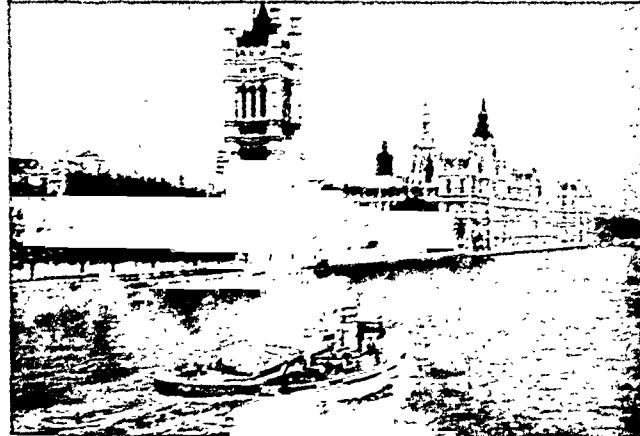
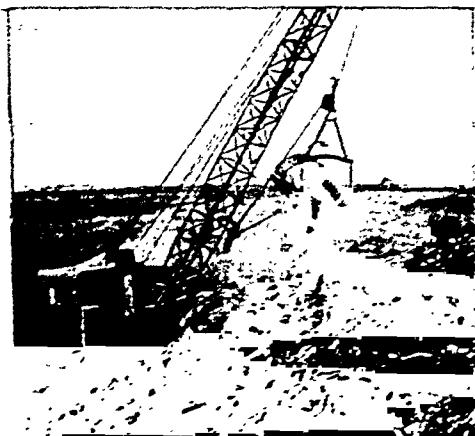
For hundreds of years people used to throw all their rubbish into the street. Sometimes the Mayor sent

round carts to collect the rubbish and tip it outside the town walls. But in the end the streets became so dirty and smelly that the job had to be done properly and regularly.



Picking over rubbish to find salvage

Nowadays, dustmen call about once a week to empty our dustbins into a dustcart. When the dustcart is full, the rubbish is taken to the disposal depot to be sorted. The rubbish is tipped out on to a moving belt where men pick out the things which can be salvaged—glass, rags and metals. Sometimes magnets are used to remove iron and steel. Salvage is so valuable that in some towns the men are paid extra for collecting it.



Some rubbish is tipped on low-lying land, some is taken out to sea and dumped

Getting rid of the rubbish

Most of the rubbish is burned in incinerators, but in some towns the rubbish is tipped on to waste land. Rubbish cannot be tipped just anywhere. Sometimes it is tipped on low-lying land to raise it, or on to uneven ground to level it. Rubbish which is tipped must be covered with layers of soil, so that there is no smell and so that paper does not

blow away. When the tip has been left for several years to settle down, houses may be built there. Sometimes the rubbish is loaded into barges and taken out to sea, where it is dumped. In America and Canada and occasionally in Britain, all rubbish (even tins), is put into a "mincer" which grinds it up so small that it can be washed away down the drain.

WATER



You know that the water which comes from the tap once fell as rain. But do you know why we can still get water from the tap even when no rain has fallen for several weeks? Why is tapwater so clean, when water in ponds and rivers is usually very dirty?

A reservoir on Dartmoor, Devon

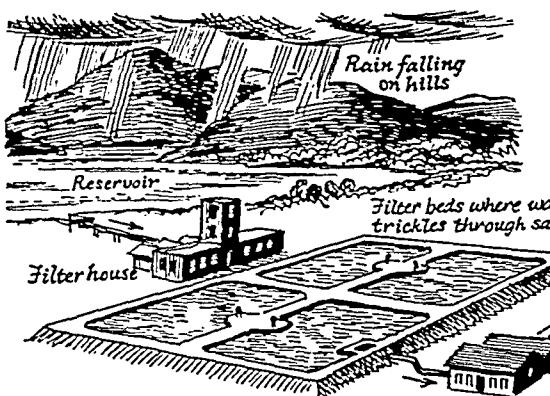
Rain falling on the hill-sides forms little streams which may flow into the valleys between the hills to form a lake. Often men make a lake by building a huge concrete wall, called a *dam*, to hold back the water in a valley.

These storage lakes are called *reservoirs*. The water which flows into the reservoir is often muddy, but in the reservoir any mud in the water sinks to the bottom. You can see how this happens if you leave a jar of muddy water standing for a time.

There is water in the reservoir even after a *drought*, a long period without rain.

Making the water pure

The clear water in the reservoir is pumped through large pipes to



How water comes from the hills to our homes



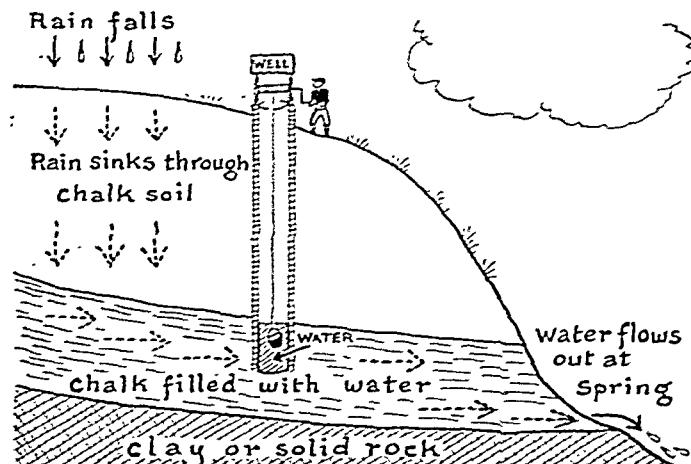
These people are queuing for water during a drought. They live in Derbyshire, and usually draw water from wells

the town. Then it is passed through fine sand, to *filter* it, that is, to take out all the dirt. Often water contains tiny plants and insects which are killed by adding to the water a chemical called chlorine. If the water is stored again it is kept in covered reservoirs to keep the water pure. The water is constantly tested to make sure that it stays pure.

The pure fresh water is pumped from the waterworks along the "mains" which run underneath our streets. Smaller pipes lead from the main supply to each house.

Water from underground

If rainwater falls on chalk soil it soaks through the chalk until it reaches a layer of clay or rock and cannot sink any further. The chalk holds water in much the same way as a sponge holds water. If a well is dug in the chalk it fills with water. The water can be drawn up in a bucket, or pumped up by an electric pump.



Water sinks through chalk, but cannot pass through clay

Water from under the ground is often so pure that we can drink it just as it comes out of the ground. But usually the water is "hard" : that is, it has chalk or limestone in it and it is difficult to get a good lather with soap when we wash our hands. Water from lakes is usually "soft".



Some of the many uses of water

Water for the big cities

London gets most of its water from the valley of the River Thames. The rest it gets from the valley of the River Lea and from wells. Most of the water is pumped into reservoirs on the outskirts of London. The water pumped from the wells in the chalk is so pure that it can be pumped straight into the main supply.

Some towns, and many factories, take their water from rivers, or from lakes in the hills many miles away, where the water is pure. Manchester gets its water from Hawes Water and Lake Thirlmere in the Lake District. The River Elan in central Wales has been dammed to make the Caban Coch reservoir, to provide water for Birmingham over seventy miles away. Liverpool, too, gets its water from an artificial lake in North Wales. Most of the water for Glasgow comes from Loch Katrine, thirty miles from the city.

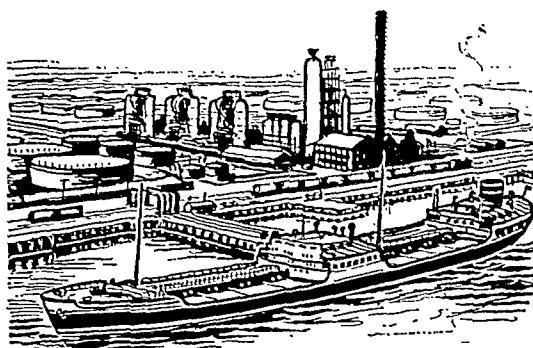
When coal is heated in the retort, what is left behind is called coke. Coke is sold for burning in boilers and enclosed fires. It is cleaner and cheaper than coal, and with a current of air to help it, coke burns well.

Many things besides gas and coke are produced at a gasworks. When the impure gases are cleaned, tar, ammonia, sulphur and other useful things are collected.

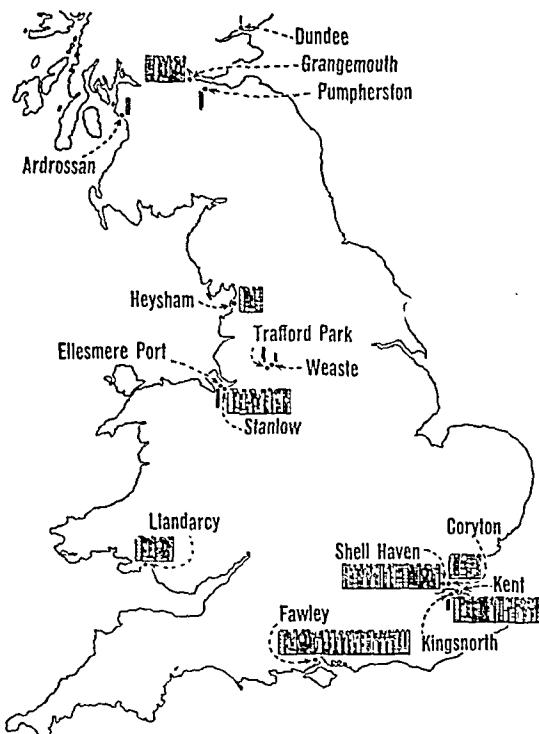
Oil, and where it comes from

Oil is another important source of power. Cars, lorries, tractors and planes are driven by oil. At power stations, oil is used to make electricity. Oil also gives power and heat for our factories and homes.

Hardly any oil is found in Britain, so most of the oil we use is brought by tankers from the Middle East, from South America, and from the U.S.A. In this country the oil is refined to make the oils we use: paraffin, diesel oil, petrol and others.



A tanker discharging oil at a refinery



Oil refineries in Britain (Scale 1 in. = 110 miles)

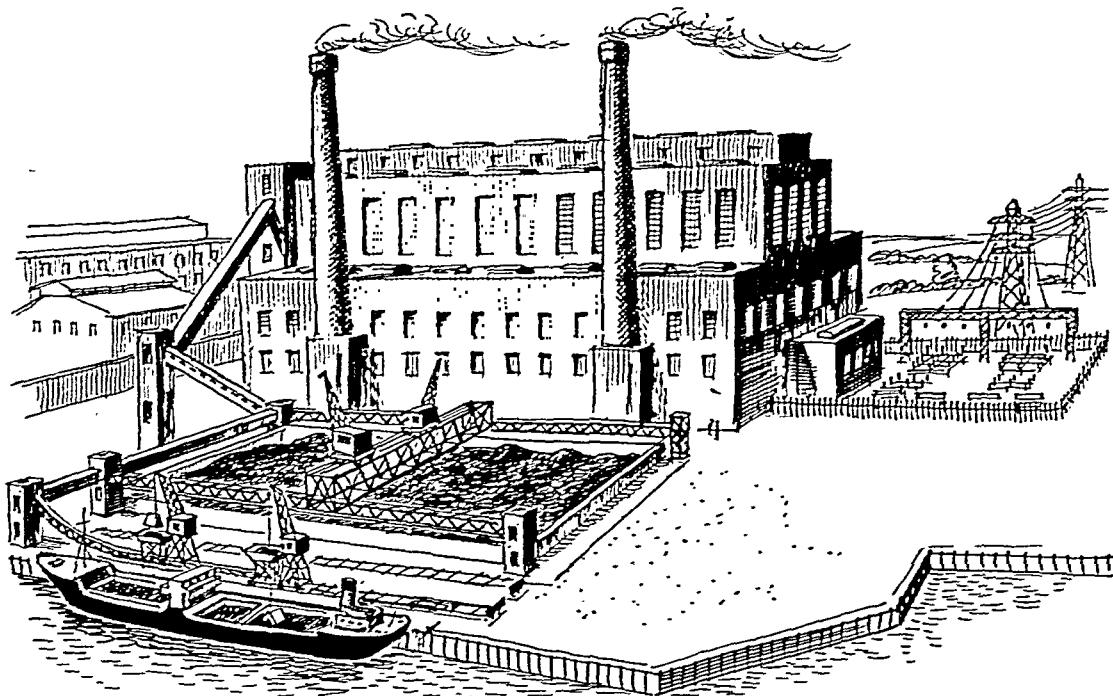
(The symbols are in proportion to the sizes of the refineries)

How electricity is made

Electricity is a very convenient form of power. We use it for heating and lighting our homes, to drive machinery in factories and to drive trolley buses and trains.

How is electricity made? A dynamo on a bicycle makes electricity. As the bicycle wheel turns, the dynamo spins, so making electricity and lighting the lamp.

In the same way, on a larger scale, huge turbines at power stations are made to turn at high speed. They drive generators which make electricity. (A water-driven turbine is shown on page 165.)



Coal is brought by boat and train to the power station. Some is stored in the storage yard. Some is carried by conveyors into bunkers over the boilers in the power station

At the power station the turbines are turned by steam power. Coal or oil are used to heat the water to make the steam.

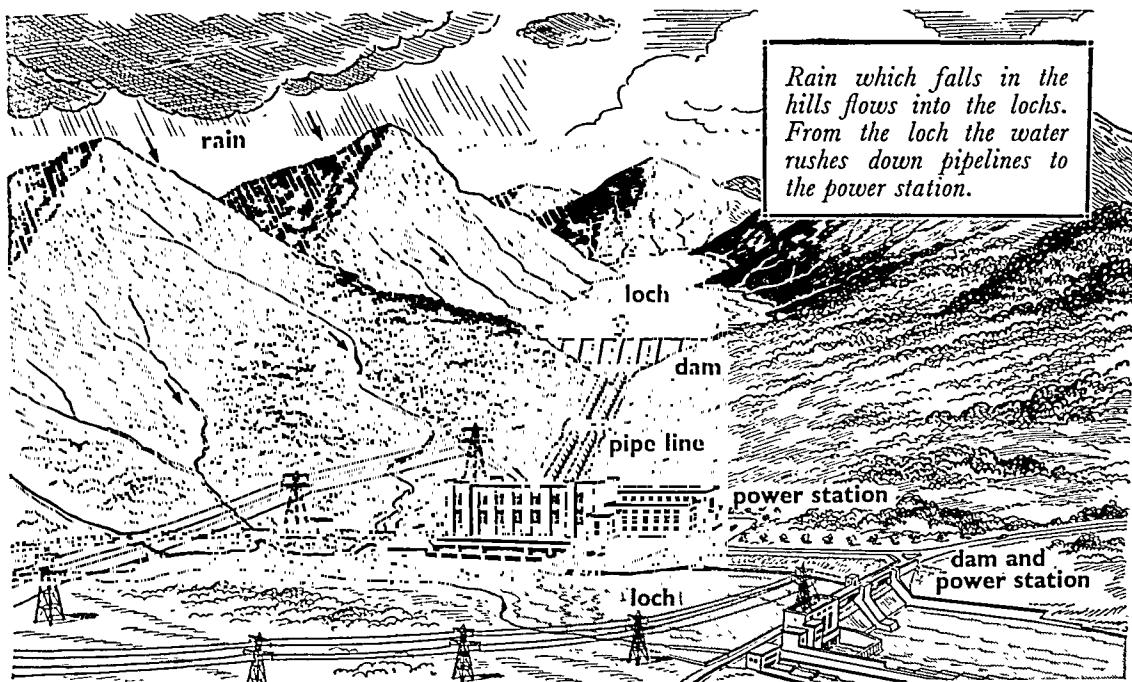
The steam which has driven the turbine has to be cooled. Much water is used for cooling the steam, so power stations are nearly always built near rivers or near the sea, or they have high cooling towers. In London, hot water from Battersea Power Station is supplied to nearby flats.

From the power station the electricity is carried by power cables. Steel towers called *pylons* carry the

cables across the hills and valleys. Because electricity can so easily be sent along wires, power stations do not need to be built near to the places where the electricity will be used.

Power for tomorrow

Coal has been mined for so many years in Britain that many of the best seams are already worked out. A time may come when there is no coal left. Nor can we be sure that we shall always be able to import enough oil from other countries. Fortunately there are other ways of making electricity, as well as by using coal or oil.



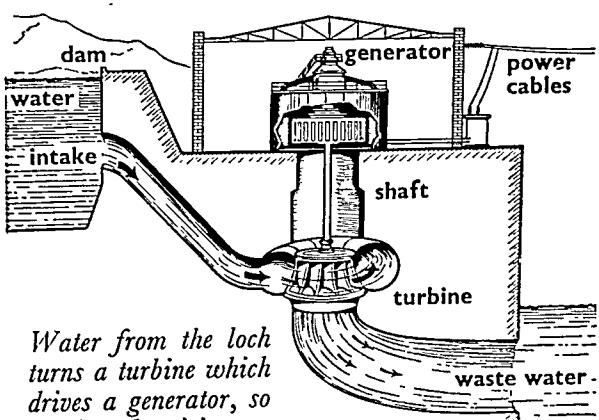
Hydro-electric power

Where there are hills or mountains, and plenty of rain, electricity can be made by using water power. Electricity made in this way is called *hydro-electricity* (hydro means water). As rain falls on the hills it forms streams and rivers. Engineers build a dam across a valley, so making a lake (called a loch in Scotland). From the lake, the water rushes down a pipeline to a generating station. The force of the water turns a turbine which drives a generator, so making electricity.

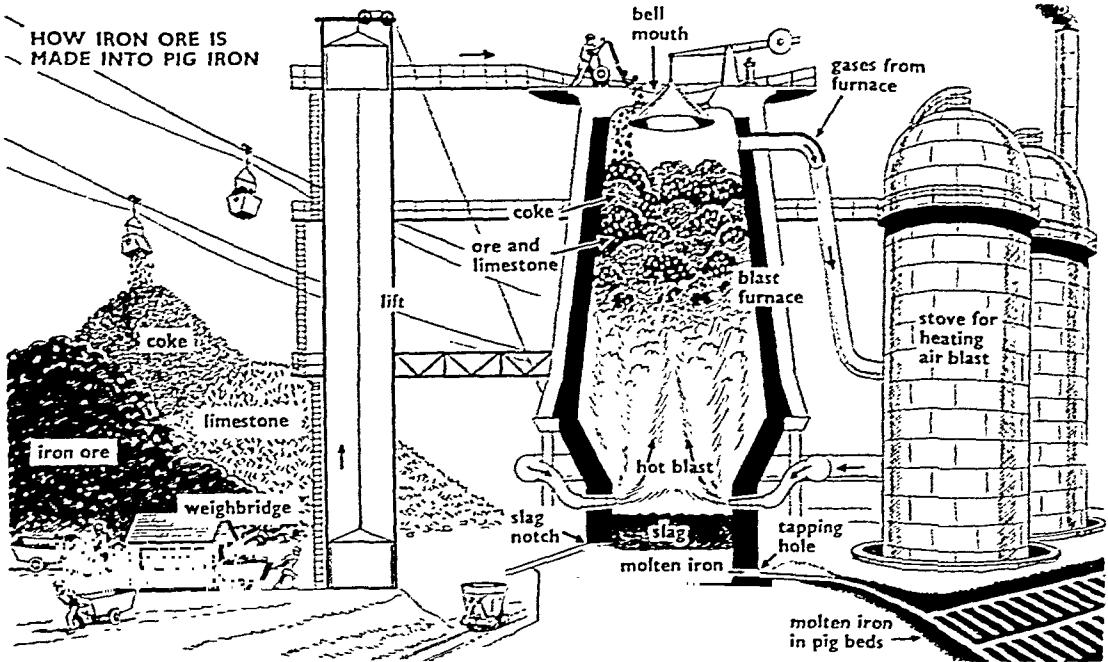
There are hydro-electric power stations at Loch Sloy, Pitlochry and other places in Scotland, and in the Snowdon region in North Wales.

Atomic power

Scientists have discovered a wonderful new source of power in the atom. When an atom is split, great heat is given off. This heat can be used to make steam to drive a turbine, so making electricity by *atomic*, or nuclear, power.



Water from the loch turns a turbine which drives a generator, so making electricity



4. IRON AND STEEL

Iron ore and where it is found

Iron ore is a rock which usually lies just under the surface of the ground. When the covering layer of soil has been removed, the iron ore is dug out, and the iron is removed from the ore. Ships, bicycles, pins and cars, are a few of the things which are made of iron.

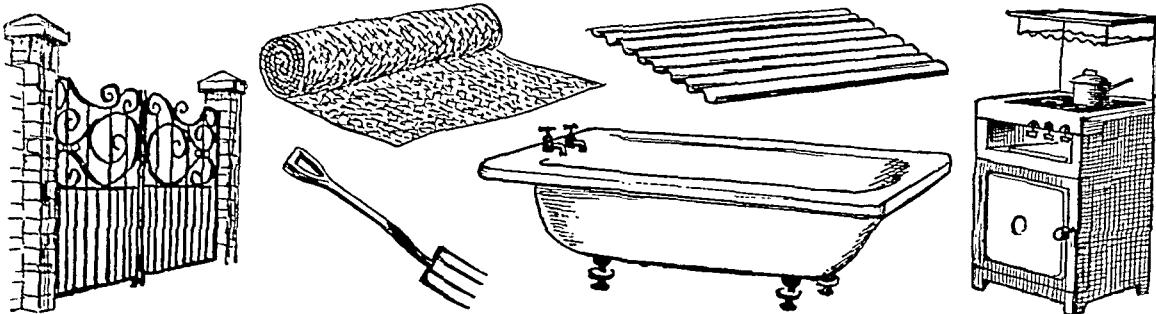
In Britain, iron ore is found in Northamptonshire, Lincolnshire, Yorkshire and Cumberland. But better ore, which contains more iron, comes to Britain by ship from Sweden, North Africa, Spain and Canada.

Smelting the iron from the ore

The ore is mixed with coke and limestone and tipped into the top

of a tall steel tower, 100 feet high. Inside the tower is a raging fire, which is made white hot by a hot blast of air. The hot air makes the coke burn so fiercely that the iron in the ore melts, and becomes a white-hot liquid, molten iron, which runs down to the bottom of the furnace. Melting the iron from the ore is called "smelting". The tall tower is called a blast furnace.

Every eight hours the liquid iron in the furnace is let out from a tapping hole at the bottom. A stream of white-hot iron pours into "pig beds", or into moulds on a moving belt. In the moulds the iron is sprayed with water to cool it, so that it sets into hard blocks of "pig iron".



Some things made from iron and steel

Pig iron, cast iron and wrought iron

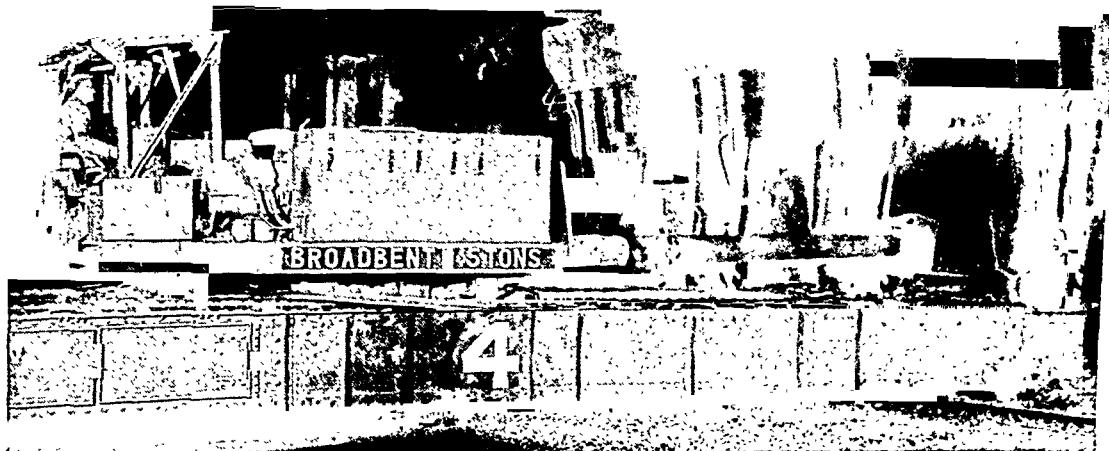
Some of the pig iron is heated again to make it molten. It is poured into specially-shaped moulds to make *cast-iron* pillar-boxes, lamp posts, grates and other things. Although cast iron is hard, it is brittle, for it breaks easily if it is hammered.

Some pig iron is heated again until it is soft enough to be hammered into shape, to make *wrought iron*. Nails, gates, and farm implements are often made of wrought iron.

Steel, and how it is made from iron

Iron is strong but *steel* is stronger. Steel was used to make the *Forth Bridge*, $1\frac{3}{4}$ miles long, and the liner *Queen Elizabeth*. Steel can also be used to make tiny, delicate things such as needles and watch springs.

Most iron is made into steel. White-hot iron from the blast furnace is carried to the steel furnace in a huge ladle lined with firebricks. The iron is heated again with limestone and with scrap metal such as railings and old bicycles. For twelve hours they are roasted in the furnace.



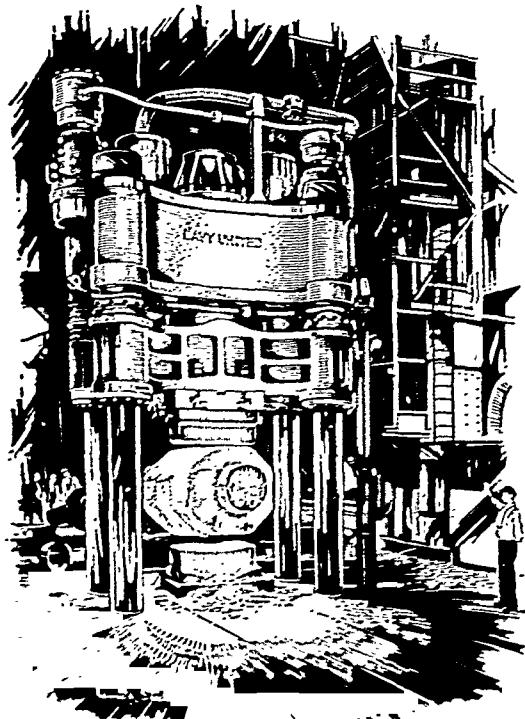
This huge shovel, worked by the man on the left, carries scrap metal to the steel furnace

Tapping the steel furnace

When the furnace is tapped, a river of white-hot molten steel pours out into a giant ladle, and showers of sparks fly in all directions. From the ladle the molten steel is poured into huge moulds. When the steel cools it can be taken from the moulds as a solid lump, called an *ingot*. The ingot may weigh as much as twenty tons.

Working the steel ingot

The steel ingot is then worked into whatever shape is needed : it may be a bar, a flat plate, or a girder. This is done by hammering, rolling or pressing.



A steam hammer striking an ingot



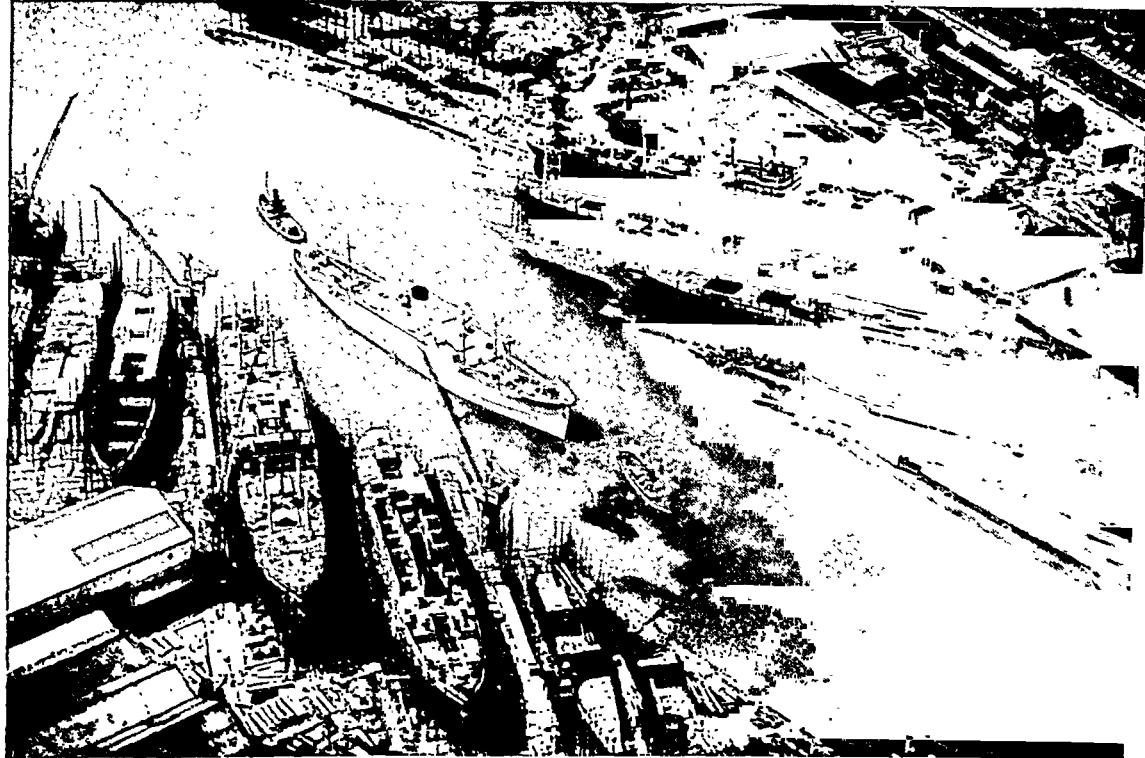
Pouring molten metal into ingot moulds

Many ingots are flattened in a "rolling mill", which works in the same way as a rolling pin. There is a deafening noise in the mill as the red-hot ingot goes backwards and forwards between the rolls until it becomes a long flat slab of steel. Later, the slabs can be rolled again into strip steel which is cut up into sheets of steel for making car bodies and tin-plate.

Ingots which are too large to be worked under a hammer are squeezed flat in an enormous press.

Britain's iron and steel works

Iron and steel works are nearly always near coal mines, for over two tons of coal are needed to make one ton of steel. There are big iron and steel works in Lanarkshire, in Middlesbrough, in South Yorkshire and in South Wales.



Shipyards on the River Clyde

5. BUILDING A SHIP

Because Britain is an island, we have always needed ships. We have built them not only for ourselves but for other countries too. Today, many of the ships sailing into harbours all over the world were built in British shipyards.

Modern ocean-going ships are made almost entirely of steel. They are built on the banks of deep wide rivers, where they can be launched safely, and "fitted out" or completed, without being exposed to the rough sea. Shipyards are always near steelworks, for steel is very heavy and it is costly to carry it far.

Planning the ship

When a new ship is wanted, the men who are going to make it say to themselves :

- “ What cargo will it carry ? ”
- “ How big shall it be ? ”
- “ Which ports will it use ? ”
- “ What sort of an engine should it have ? ”

Then designers set to work, making hundreds of drawings of every part of the ship. When they have planned the ship, an accurate model of the *hull*, or shell, is made. The model is tested in many ways in a water tank, to make sure the design is good.

After many months of preparation, cranes are put into place on the slipway where the ship is to be built, and work begins on the hull. Firms in many parts of the country will make the parts of the ship: the engines, the steel plates, the propellers, the furniture and all the other fittings.

Building the ship

First the *keel*, or backbone of the ship, is laid. It is made of huge steel girders which are joined together by *rivets*. A rivet is a small piece of red-hot steel which is put through holes in the two girders and then hammered. As the rivet cools, it pulls the girders together.

A framework of girders, looking like ribs, is built on to the keel, and covered with steel plates, which are riveted on to it.



Joining steel plates together by using an electric arc-welding set

Sometimes the plates are *welded* together. This means that the edges of two plates are heated and made so hot that when they are hammered together they become one.

Nowadays many smaller ships are *prefabricated*. This means that parts of the hull are built separately in workshops and then welded together on the slipway.

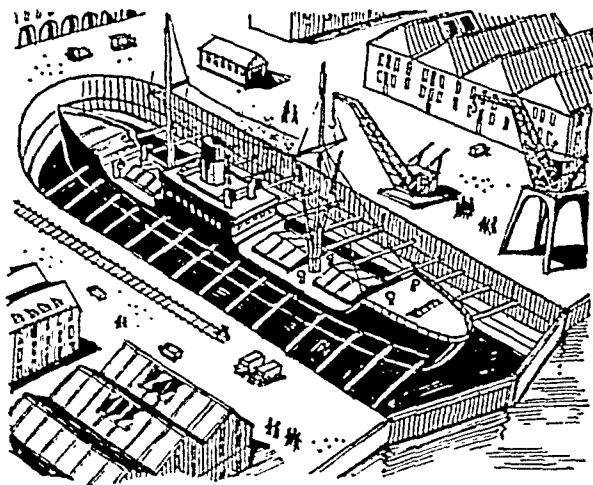
When the hull of the ship is complete, there comes the most thrilling moment—the *launching* of the ship. At a special ceremony the ship is named, the last supports are taken away, and the huge shell slides down the slipway into the river.

Fitting out

Tugs tow the ship to a *fitting-out* *basin*, nearer the mouth of the river, where the engines and all the fittings are added. It takes two years of hard work before a big ship is ready to sail the seas.



The riveter's hammer is driven by compressed air

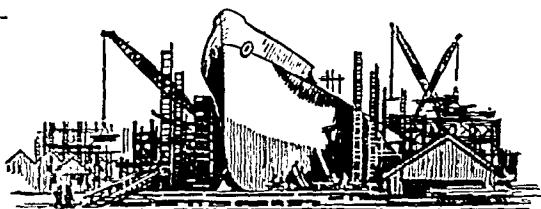


Repairing and painting a ship in a dry dock

Britain's shipyards

The two most important ship-building areas in Britain are the north-east coast and the estuary of the River Clyde.

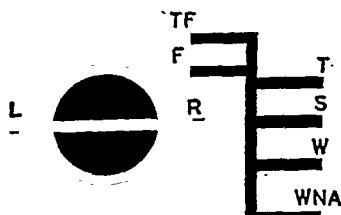
In north-east England there are shipbuilding yards near the mouths of the rivers Tyne, Wear and Tees.



When the ship has been fitted-out, her makers take her out "on trial". At sea she has to pass all kinds of tests to prove that she will do all that her designers planned.

A refit in dry dock

After a ship has been sailing for some time she must have an over-haul, or re-fit, as it is called. Nearly every port has a repair yard, and many have a *dry dock*. When the ship sails into a dry dock, gates are closed behind her. The water is pumped out of the dock so that the hull of the ship can be repaired and painted before its next voyage.



The Plimsoll line, painted on a ship's side, shows how deep in the water the ship can be loaded. The depth varies with the season and the kind of water

(LR=Lloyd's Register; TF=tropical fresh water; F=fresh water; T=tropical; S=summer; W=winter; WNA=winter North Atlantic.)

In the shipyard huge cranes carry girders and plates, brilliant lights flash from the oxy-acetylene flames, and the riveters' hammers bang endlessly. From this noise and bustle a beautiful ship emerges

One of the largest shipyards is John Brown's at Clydebank, where the liners *Queen Mary* (81,000 tons*) and *Queen Elizabeth* (83,000 tons) were built. There are many other shipyards on the River Clyde, at Dumbarton, Glasgow and Greenock.

The largest single shipyard, Harland and Wolff's, is at Belfast.

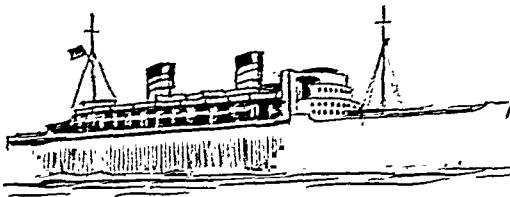
Cammel Laird have large shipyards at Birkenhead on the River Mersey, where they build cargo ships, liners and tankers. Barrow is famous for building submarines.

* The size of a ship is measured by its volume, calculating 100 cubic feet = 1 ton. The *Queen Mary* has a volume of 8,100,000 cubic feet.

$$\frac{8,100,000 \text{ cu. ft.}}{100} = 81,000 \text{ tons.}$$

Shipyards along the estuaries of the Rivers Forth, Tay, Tyne, and Tees, build cross-channel steamers, and "tramps" (ships which carry any cargo and sail on no fixed route). Fishing boats are built at many of the fishing ports, such as Aberdeen and Hull.

Some British ships



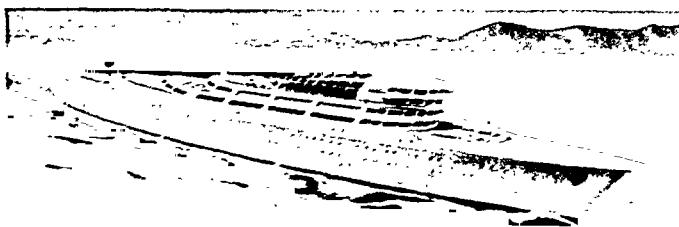
The Queen Elizabeth, an ocean liner

The *Queen Elizabeth* (83,000 tons), the largest passenger-carrying liner, is almost a floating town. She has lounges, ballrooms, swimming pools and shops—everything that her 2,200 passengers could possibly need.



A tramp steamer

This *tramp steamer* (5,000 tons) carries cargoes such as coal, grain, or iron ore which are loaded in "bulk" and not packed in packing cases. The cargo is stowed in holds below the decks.



An oil tanker

This *oil-tanker* carries 25,000 tons of oil. Each of the many tanks in which the oil is stored has its own pipes, so that the ship can be unloaded in a few hours.

A tanker has only one deck, and its engines and living quarters are near the stern. The bridge is amidships, with a gangway called a "catwalk" connecting it to the forecastle and stern.

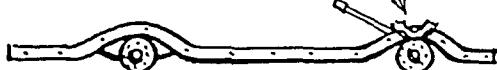
Many ships built in British shipyards are for special tasks: trawlers, drifters, whalers, tugs, dredgers, lightships and cableships. Refrigerated ships carry meat, fruit, butter, eggs and fish. The food keeps fresh even in the hottest weather.

The ship's engines

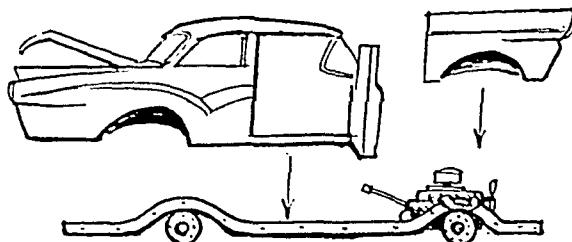
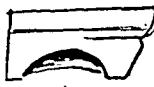
Most of the ships sailing today have a screw, or propeller, to drive them. The propeller is turned by an engine. For many years most ships were driven by coal-fired steam engines, but many of these have been converted to burn oil. Nearly half the ships sailing today, and most

newly-built ships, are driven by diesel engines. Nuclear power is used to drive some submarines.

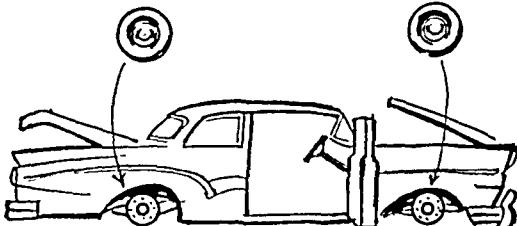
Nuclear powered tankers and liners have been planned. This drawing shows a nuclear powered liner of the future



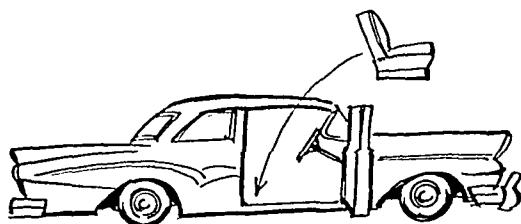
The engine is bolted to the chassis



The body and front end, each made up of many parts, are added



The wheels are bolted on to the axles



The seats and all the interior fittings are added



Finally the tank is filled with petrol and the car is inspected, before being driven away

6. MAKING CARS and other things from iron and steel

Steel from the steel works goes to factories in many parts of Britain. A great deal of it goes to factories making motor vehicles. Did you know that over one million vehicles are made in Britain every year? As well as steel, the finished cars and lorries need many other materials, such as rubber, glass, plastics, leather, wood and aluminium.

The parts of a car are often made in different factories—the engine in one factory, the electrical fittings in another, the tyres at another, and so on. Then all the parts are brought together at one factory and *assembled* to make the finished car.

The "assembly line"

The frame of the car, or *chassis*, is moved by stages through the factory and the various parts of the car are bolted to it. The route which the chassis takes, as it is gradually made into a car, is called the *assembly line*. Each man on the line does the same job all day, fitting or adjusting one particular part of each car when it reaches him. In this way he becomes very skilled at the job he is doing, and does not waste time in changing from job to job. (See the coloured picture facing page 176.)

Britain is famous for making small cars, motor cycles, and magnificent large cars which are used by Ambassadors, officials and business-men all over the world. Over half the vehicles made in Britain are sold abroad.

Where cars are made

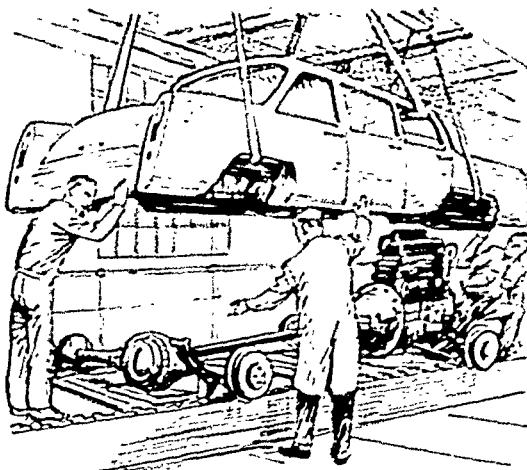
Most car factories are in the Midlands and in the London area. There are factories at Birmingham (making *Austin* cars), at Coventry (*Jaguar*, *Hillman*, *Standard*), Oxford (*Morris*), Crewe (*Rolls Royce*), Luton (*Vauxhall*), and Dagenham (*Ford*).

“Heavy engineering”

Glasgow, Lanarkshire and Middlesbrough are famous for “heavy engineering”. Ships are built there and railway engines, cranes, lifts, bridges and lathes. Bridges in many parts of the world, including the famous Sydney Harbour Bridge, are made of British steel.

“Light engineering”

Light engineering works make small things from iron and steel, and so the works themselves do not need to be large. They make typewriters, watches, electric fires, etc.

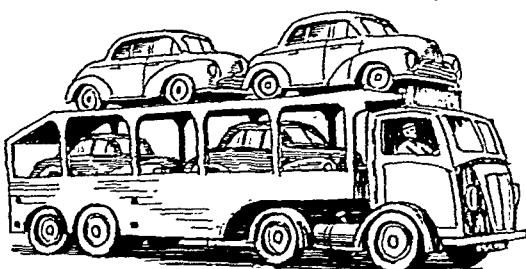


Lowering a car body on to its chassis

There are many light engineering works in the Midlands of England, around Birmingham. This district has been called the “Black Country”, from the time when factory chimneys and furnaces poured out smoke and soot, covering everything with grime. Although the area is much less grimy nowadays, it still keeps its name.

There are many coal mines and iron and steel works of every kind in the Black Country. All kinds of metal things are made, from railway engines and cars, to tools, locks, nails, nuts and bolts.

In some factories steel is coated, or *plated*, as it is called, with another metal: tin-plated steel is made into tins to store meat, fruit and vegetables. Some steel is plated with zinc, or *galvanized*, to make dustbins, buckets, and corrugated sheeting for roofs.

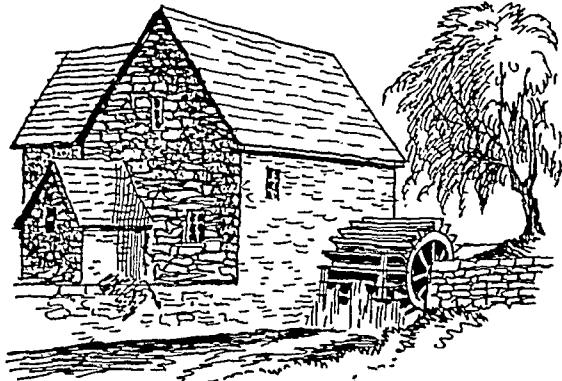


A car transporter

The first woollen mills

As the population of Britain grew, and more people wanted woollen clothes, machines were invented to spin and weave the wool more quickly. These machines were too big and too costly for most people to buy, so factories and mills were built. Here, rough wool bought from farmers in the district was spun and woven into cloth. The mills were always built near a stream so that the water of the stream could be used for washing the wool and for driving the machines in the mills.

Later, when steam engines were invented, they were used to drive the machines. Coal was needed to make the steam engines work, so in time mills were built in places where there was wool, coal and water. Many mills were built in the West Riding of Yorkshire to weave the wool from the sheep which grazed on the Pennine hills.



An old woollen mill beside a stream

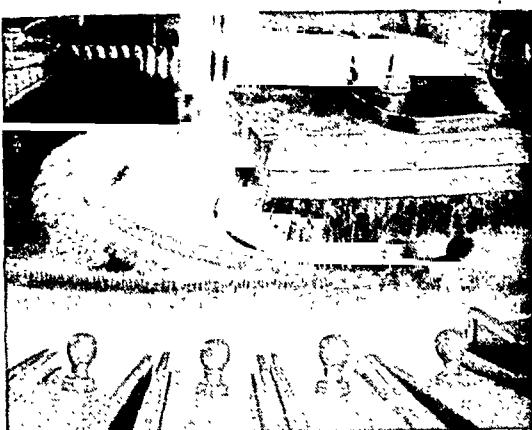
Wool from other countries

As the population continued to grow, more and more wool was needed. There were not enough sheep in England, so wool was obtained from other countries : from Australia, New Zealand, South America and South Africa. Today, wool from these countries comes to London, Liverpool and Hull, and it is sent to the mills by road.

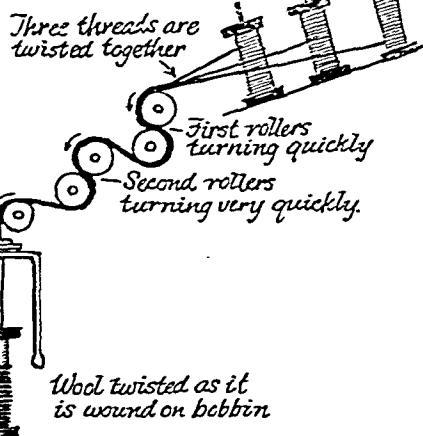
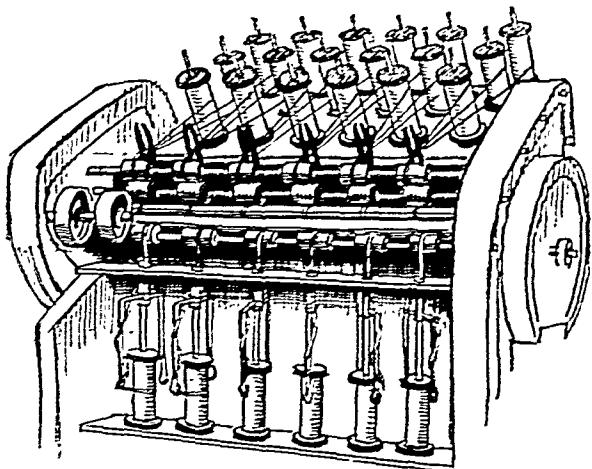
At the mill the wool is sorted according to its length, its strength, and how "crimpy", or wavy, it is.

The wool is still just as it was when it was taken from the sheep : dirty, greasy and tangled. It is boiled with soap, and dried by hot air.

The wool is then combed by spikes on a roller. If the wool is to be made into fine "worsted" cloth, it is combed again until all the hairs lie the same way.



This comb pulls the long fibres from the short



The spinning machine pulls out and twists the loose slivers of wool. This makes a thin yarn

Spinning the wool

The combed wool is drawn off as a long loose rope called a *sliver*. The slivers are too thick and loose for weaving, so they are pulled out and twisted on spinning machines. This makes a *yarn* which can be wound on to a spool.

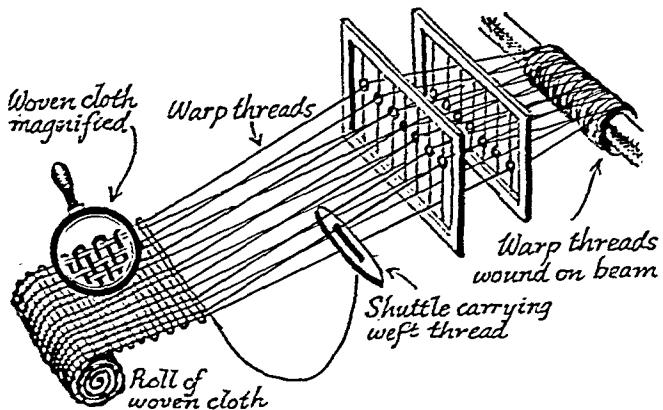
Some wool is dyed and sold for knitting wool. Wool which is used for making coats, skirts and suits is woven into cloth.

Weaving the threads into cloth

In simple weaving, one thread goes backwards and forwards, under

and over the threads which lie in the opposite direction. But modern looms can weave much more complicated patterns than this.

The cloth which comes from the looms is often fluffy. Cloth for blankets is brushed to make it even more fluffy, but most cloth is beaten to make the threads lie close. Then it is put through a machine which works like a lawn-mower, and cuts off any long hairs. The cloth is damped and left to shrink, and it may be mothproofed before it is pressed and rolled.



Sometimes the woollen yarn is dyed, and different colours of wool are woven to make a patterned cloth. Sometimes the wool is dyed after it is woven, so that the cloth is all one colour.

A simple weaving machine. As the warp threads are raised and lowered the weft thread goes backwards and forwards

The woollen towns of Yorkshire

Most of Britain's woollen towns are in Yorkshire, in the valleys of the rivers Aire and Calder. They are each famous for a different kind of cloth. Carpets are made in Halifax ; fine woollen cloth, called *worsted*, is made in Bradford ; and a cloth called *shoddy*, made from woollen rags, is woven in Dewsbury and Batley. Both woollen and worsted material are made in Huddersfield. Leeds, the biggest "woollen town", has many factories where cloth is made into suits and coats.

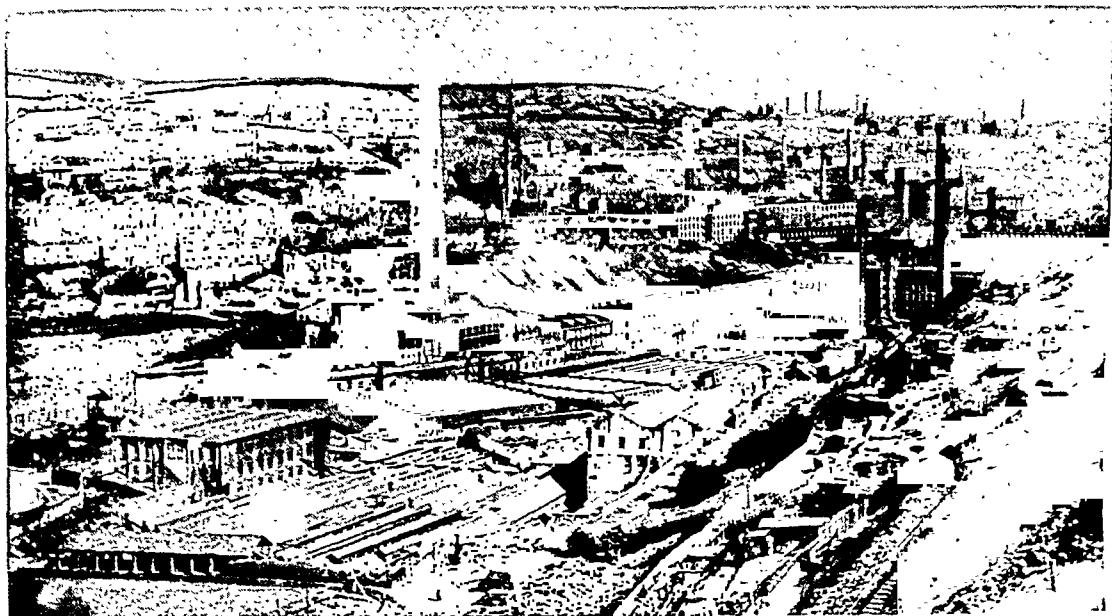
Some other woollen towns

Wool is made into cloth in other parts of Britain, as well as in Yorkshire. In the valley of the River Tweed, in the south-east of Scot-

land, fine woollen socks, jumpers, and cloth called "tweed" are made. A good quality cloth, which is used for uniforms and billiard tables, is made at Stroud, in the west of England. Blankets are made at Witney and carpets at Kidderminster and Axminster.

Although nearly all cloth is now made in factories, there are still a few people who spin the wool, and weave the cloth, in their own homes. In the islands of the Hebrides people make the famous "Harris tweed" and Fair Isle knitwear in their homes.

British clothes made of wool are among the finest in the world and many of them are sold to other countries. Canada and the U.S.A. buy some of our best woollen goods.



Halifax, a woollen town in the valley of the River Calder, Yorkshire

9. COTTON

When we say "cotton", we may mean the raw cotton which comes from the cotton plant, the cotton thread which is used for sewing, or cotton cloth. In this chapter, "cotton" means *cotton cloth*.

In the Middle Ages, the people of Britain usually wore clothes made of wool or linen. Later, cotton was brought from India, but the cotton threads, which were spun by hand, were not very strong. Good cotton was not made until machines were invented to spin strong threads, and to weave the threads into cloth. Then raw cotton was brought from America and landed at Liverpool in Lancashire. In time, Lancashire proved to be the ideal place for the manufacture of cotton. There was water power, and later coal, for driving the machines. The air was damp so that the threads did not break during spinning. The water



Breaking open bales of cotton



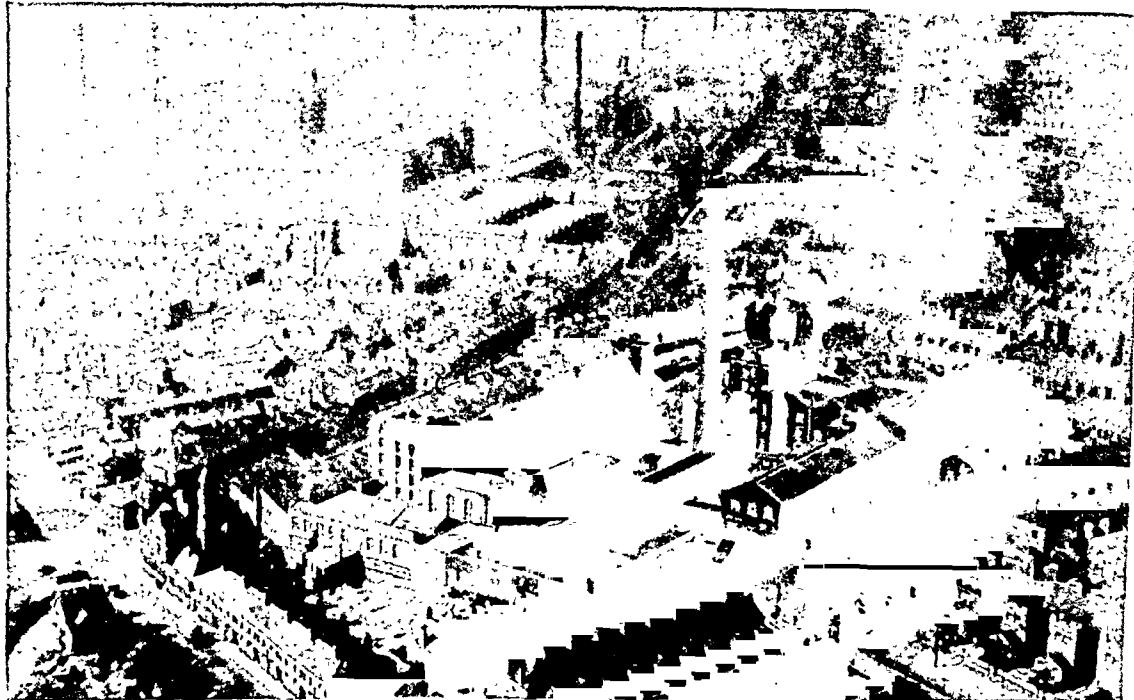
Workers leaving a cotton mill

in the streams was soft for dyeing. Furthermore, the people were skilled at making woollen cloth, and soon learned how to make cotton.

Most of Britain's raw cotton still comes from the United States of America. The Sudan, Brazil, Uganda, and West Africa also send raw cotton to this country.



The carding machine combs out the fibres to make a loose rope, called a sliver



Oldham, a town in Lancashire where cotton is spun

Most of the raw cotton is landed at Liverpool or taken up the Manchester Ship Canal to be unloaded at Manchester. Then it is sent to the mills of Oldham, Bolton, Rochdale and other towns in South Lancashire, where it is spun.

Spinning and weaving

In the mills different raw cottons are mixed, and then beaten until all the pieces of stalk, leaf or seed have been shaken out. When the raw cotton has been cleaned it makes a fleecy sheet like a huge roll of cotton wool. This goes through a "carding" machine which combs out the fibres. The fine web of fibres is drawn up to make a loose rope called a *sliver*. The sliver is pulled out and twisted, by a spinning machine, to make a strong thread.

Usually the raw cotton is spun at one mill and the thread is woven into cloth at another. Burnley, Blackburn and Preston are towns in the north of Lancashire which are famous for their weaving.

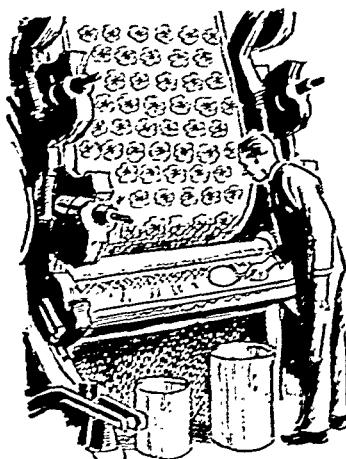
If you visit a weaving mill there is so much noise from the rows and rows of looms that you cannot make yourself heard. But the women who work the looms become used to the noise, and learn to lip-read so that they can talk to each other.

A woman weaver can look after sixteen to twenty automatic looms. If a thread breaks, the loom stops itself. Then the weaver joins the thread again and restarts the machine.

“Finishing” the cotton

Cotton which is spun in one town and woven in another, may be sent to a third town to be bleached, dyed and finished. Many of the soaps and chemicals needed for these processes are made in Cheshire. The cloth is thoroughly washed and bleached to turn it from grey to sparkling white. Then most of the material is printed with patterns of different colours from a rubber roller.

Some of the cotton thread is dyed before it is woven, and different colours of thread are woven to make a patterned cloth. Other cotton is dyed after weaving, to make cloth of one colour.



*Printing a pattern on cotton.
The man is pouring dye on
to the printing roller*

Very often cotton thread is woven with the new “man-made” fibres such as nylon and terylene to make new materials. Cottons can now be permanently pleated, glazed, made shrink-resistant, and “drip-dry”.

*Jig dyeing. The cotton passes from one roller,
through the trough of dye, and on to the other roller*

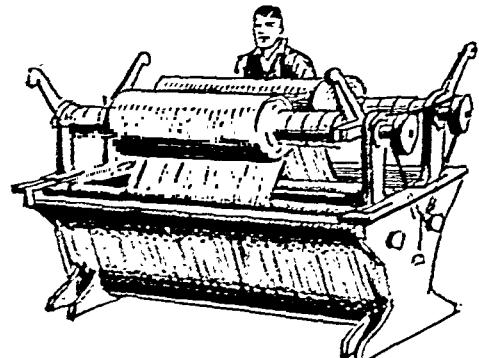


*Designing a pattern to be
printed on cotton*

Selling the Cotton

Most of the cotton cloth is sold to buyers who come to Manchester. Three-quarters of them are British buyers, the rest are from overseas. A great deal of cotton is printed with gay, colourful patterns and sold to the people of West Africa.

At one time a great deal of cotton cloth was sent to India and Pakistan. Now the people in these countries have their own cotton mills which make cloth from the cotton grown locally. The workers in the mills are paid very little, so the cloth they make is cheap—much cheaper than the better quality cotton made in Lancashire.



10. SOME OTHER TEXTILES

Linen

Wool comes from an animal's back, cotton comes from a plant. *Linen*, a very strong cloth which is made into tablecloths and handkerchiefs, is made from a plant called flax. When the flax is fully grown it is from three to four feet tall.

The stems are pulled up by hand, tied in bundles, and soaked in water for ten days until the woody part rots away : this is called *retting* the flax. The linen fibres which remain are cleaned, spun, and then woven into cloth.



Putting flax in water to ret the woody part from the linen fibres

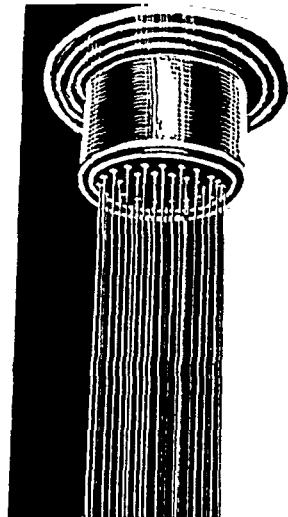
Linen is made in factories in Northern Ireland. At one time all the flax used in the factories was grown locally, but now most of it comes from Belgium and Russia.



Pulling flax

"Man-made" fibres

Today, many fibres which are used for cloth are made by forcing a sticky liquid through very fine holes. As the liquid dries it makes a thread which is later woven into cloth.



Forcing a liquid through holes to make threads

Fibres made in this way are often called "man-made", but really we mean that they are "made by man from animal or vegetable sources". For example, *rayon* comes from a liquid which is made from wood pulp or cotton waste, both of which once grew in the earth. *Nylon* comes from coal which was once a forest. *Terylene* is made from oil, which consists of the remains of tiny creatures buried millions of years ago.

Factories in Coventry, Derby, Lancashire and North Wales make rayon. Nylon is made at Pontypool and Doncaster. Terylene is made in a factory near Middlesbrough.

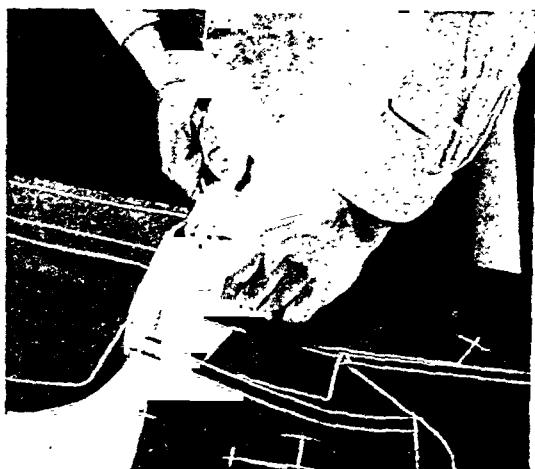
II. MAKING CLOTHES

A tailor-made coat

If you want a new coat, you may be lucky enough to know someone who can make it for you. He will measure you carefully, cut out the material, and sew the pieces together to make your new coat.

"Ready-made" coats

But more often you will buy a "ready-made" coat from a shop. Hundreds of coats of the same style and material are made in factories. All the cutting-out and sewing is done by machine. In each part of the factory different parts of the coats are made—hundreds of sleeves in one workshop, hundreds of collars in another.



Cutting out a suit by hand

Ready-made coats, manufactured in a factory, are cheaper than coats made by a tailor. They can be produced cheaply because hundreds are made at the same time, and because most of the work is done by machine, and not by hand.

Most clothes are made at factories in large cities such as London, Glasgow and Birmingham. In these places there are many people wanting to buy the clothes which are "mass-produced".

Some clothing factories are near the mills where the cloth is made. The factories of Leeds make suits and coats from woollen cloth woven in other towns in Yorkshire. The factories of Manchester make cotton dresses and shirts from cotton woven in the mills of Lancashire.

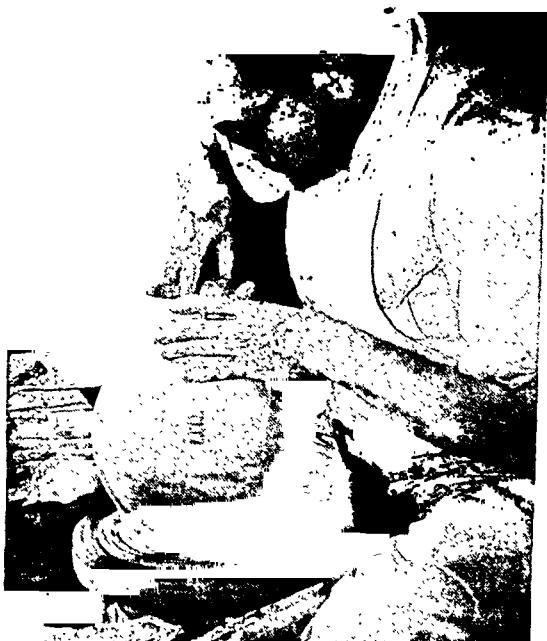
Using a machine to cut out 40 blouses



12. MAKING POTTERY

The easiest way to make pots is to roll clay into long strips and to coil the strips round and round. Better pots can be made by putting a lump of clay on to a revolving wheel. As the wheel spins, the potter skilfully hollows out the centre of the clay with his fingers and pulls up the clay to make the sides of the pot. The pots are baked in an oven called a *kiln*, until the clay is hard.

Many years ago people in the Midlands started to make coarse pottery, called *earthenware*, from the clay which they found near their homes.



Making a vase on a wheel



*The pottery town of Hanley, in Staffordshire.
The round buildings are kilns*

"The Potteries"

As more and more pottery was wanted, the clusters of homes and kilns became villages, and the villages became towns. Stoke-on-Trent is the biggest pottery town in a district of Staffordshire known as "the Five Towns" or "the Potteries". Most of the pottery made in Britain today comes from this area.

Some coarse local clay is still used in the Potteries to make drainpipes and tiles, but most of the clay comes from other places: *ball clay* from Devon or Dorset, *china clay* or *china stone* from Cornwall, *flint* from the sea shore, and *bones* from Argentina.

Sometimes the clay is sent to the Potteries by rail. But usually the clay, the stones, the flints and the bones go by ship to the River Mersey. Then they go by barge along the canals to the Potteries of Staffordshire.

Mixing the clay

At the pottery these materials are ground into fine powder and mixed with water, to make a sticky clay. The clay is shaped on a wheel to make lovely vases, jugs and teapots. But plates, cups and saucers, which are needed by the million, are made in moulds. To make a plate, a ball of clay is flattened on a revolving wheel. The flat clay is thrown into a mould which shapes the front of the plate, and then spun on a "jigger", where the back is shaped by a piece of metal.

Firing the pottery in a kiln

When the clay has been shaped, on a wheel, or in a mould, it is baked, or *fired* as it is called, inside



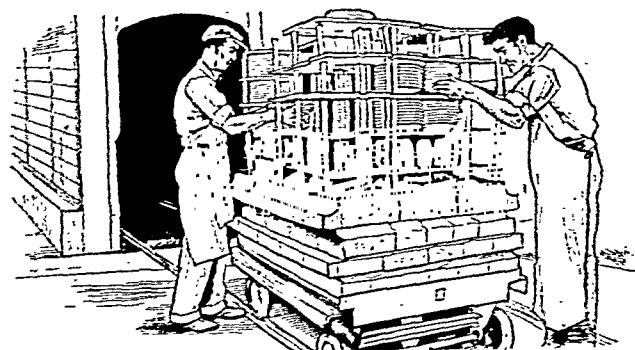
Shaping the back of a plate

a kiln. The kiln is heated for two days, very gradually, so that the china and pottery do not crack. Then it is allowed to cool, very slowly, before it is opened.

Many potteries still use bottle-shaped kilns, heated by coal fires. The smoke from the kiln chimneys covers the towns with a blanket of smoke. The smoke only clears away on Sundays and at holiday time when the potteries are not at work. Modern kilns are electrically heated and do not give off smoke.



Taking a vase from a mould



The truck will move very slowly through an electric kiln



Painting a design on a plate



Putting on a paper transfer



Packing the pottery in a barrel

Decorating the pottery

When the pottery has been fired, it is still whitish in colour, so it must be coloured. The finest china is painted by hand, but most china is given a pattern from a "transfer", in much the same way as you put transfers into your scrap book.

When the pots have been decorated, they are dipped in a thin mixture known as "slip" or glaze. Then they are "fired" again to harden the glaze.

The finished china is carefully packed between straw in barrels and

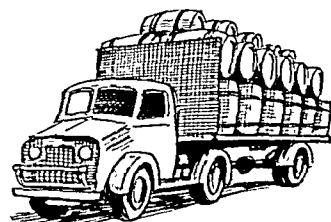
boxes, and taken away from the factory by lorry.

Some famous British firms

Nearly half the china made in Britain is sent abroad. Many people in the U.S.A., in Canada and in Australia buy bone china or earthenware made by such famous British firms as Wedgwood, Spode, Royal Worcester, Royal Doulton, Minton and Royal Crown Derby. Next time you use a plate or a cup, look at the bottom of it. It may say what kind of pottery or china it is, and where it was made.



Britain is famous for making fine china



A lorry-load of pottery

13. BRITAIN'S INDUSTRY

Britain is an industrial nation : eleven people work in mining, manufacturing and building for every one who works on a farm. There are eight main areas where this industrial work is done :

London
The Midlands
Yorkshire
South-East Lancashire
Tyne-side and Tees-side
South Wales
Central Scotland
and Belfast in Northern Ireland.

in England



Why have most of Britain's factories been built in these areas ? There are a number of reasons. Here are some of them.



Coal

Until recently, most factories needed coal to drive their machinery and so the great industrial areas grew up on, or near, coalfields. Today, coal can easily be carried by rail, and other sources of power are taking the place of coal, so it is not so necessary for factories to be near to a coalfield.

Raw materials

Many factories are built in the places where their raw materials are found, or where they can easily obtain their raw materials. Thus, they must be close to a main road and railway, and if they depend on materials from overseas, near to a port.



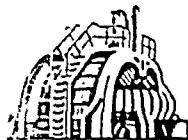
Labour

In some parts of the country there are towns which have only one main industry. For instance in the Rhondda Valley in Wales it is coal mining, in Jarrow it is shipbuilding, in Oldham it is cotton spinning. If the factories in these towns cannot sell the things they make, many people are out of work.

Nowadays, to help to find jobs for everyone, manufacturers are encouraged by the government to build new factories in areas where there are many men out of work.

Some cities are too big

“ New towns ” have recently been built, to attract some of the people living in the big cities. These towns have a wide variety of industries.



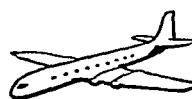
Electrical machinery



Ships



Other machinery



Aircraft



Chemicals



Woollen goods



Iron and steel



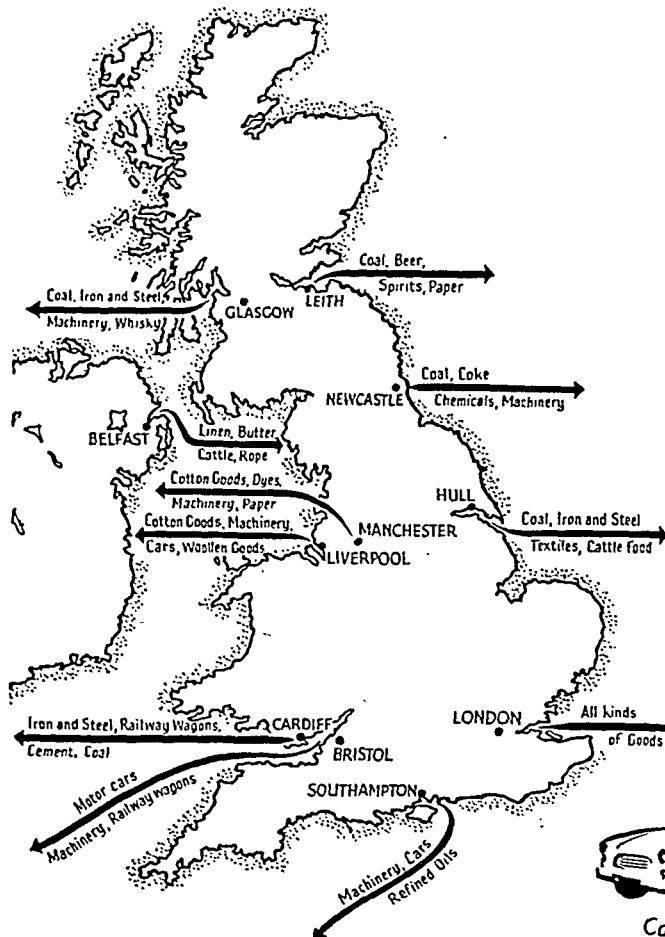
Cotton goods



Food, drink, tobacco



Cars and tractors



Britain's exports. The map shows the main ports and some of the things shipped from them

Raw materials

All the coal needed in our factories is mined in Britain. But many of the raw materials used in the factories must be imported: over half the iron ore, and most of the wool and timber, come from other countries. (See the diagram on the opposite page.)

Cotton and rubber cannot be grown in Britain and must be imported. Other countries supply all our petroleum, and nearly all our tin, copper and bauxite (for making aluminium.)

BRITAIN'S EXPORTS

Schoolchildren are always "swopping" things—stamps for conkers, comics for marbles. In the same way countries "swop" the things they make, or the things they grow, for the things they want.

The diagram on this page shows the most important things which Britain sends abroad ("exports") in exchange for the food and raw materials she imports. It also shows the main ports, and the things which are shipped from them.

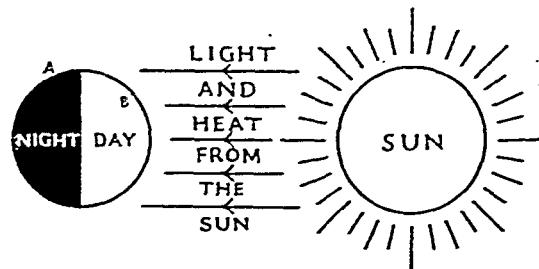
15. DAY, NIGHT AND THE SEASONS

The sun gives light and warmth to the earth

The sun is a gigantic mass of flaming gases, more than a million times the size of the earth. The heat of the sun would scorch up anything near to it. But the earth is 93 million miles from the sun. It is far enough away not to be scorched to a cinder, yet near enough to receive the light and warmth which make life possible. Without the sun the earth would be so cold that no living thing could survive, and there would be complete darkness.

The earth spins round once in every twenty-four hours. The sun can only light the side of the earth which faces it, so the rest of the earth, away from the sun, is in

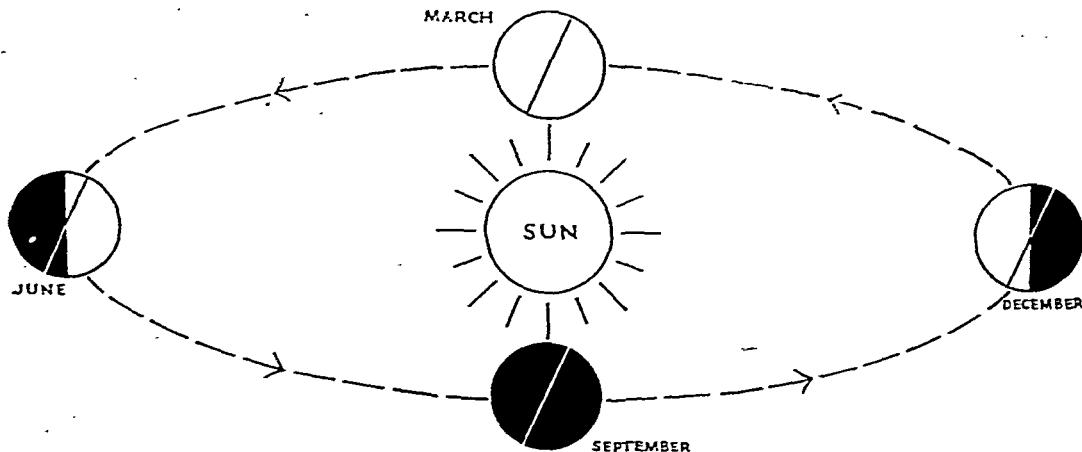
darkness. During twenty-four hours each part of the earth has one day and one night. When there is daylight in Britain there is darkness in Alaska ; when there is darkness in Britain there is daylight in Alaska.



When there is daylight in Britain (B), there is darkness in Alaska (A)

The earth goes round the sun

As well as spinning on its own axis, the earth makes a long journey round the sun. The time taken by the earth to travel once round the sun is one year.



The earth travels round the sun. The time taken on this journey is one year

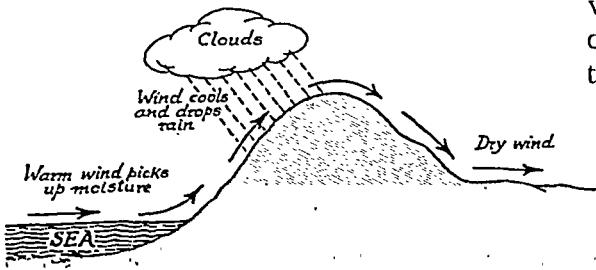
16. BRITAIN'S WEATHER

In Northern Germany in the middle of winter it is bitterly cold. Anyone going out-of-doors wears fur-lined boots and a fur hat, as well as gloves and plenty of warm clothing. In Chicago, and in New York too, it is so hot in mid-summer that everyone who can, leaves the city.

Although Britain is about the same distance from the equator as these places, its weather is never quite so hot or so cold. Why is this? It is because Britain is surrounded by sea, which gets warm slowly and loses its heat slowly. As a result the winds which blow from the sea are never very hot or very cold.

Nor does Britain have a definite wet or dry season, as do the countries of Southern Europe which have nearly all their rain in winter, and long dry summers. Britain's mild weather, with rain at all times of the year, is usually called *temperate* or *maritime* (affected by the sea).

In winter the west of Britain has milder, damper weather than the rest of the country. The wind which blows most frequently over Britain is a south-west wind.



Learning to ski in the Cairngorms, Scotland, where snow often falls, and lingers, in winter

It is a warm wind in winter because it has blown from warm seas nearer the equator, bringing with it a warm sea current called the Gulf Stream. This current warms the seas round Britain.

After a shower on a hot summer's day the warm air dries a wet road very quickly. The water on the road becomes water vapour which is carried by the air. In the same way the south-west wind, blowing over warm seas, picks up moisture.

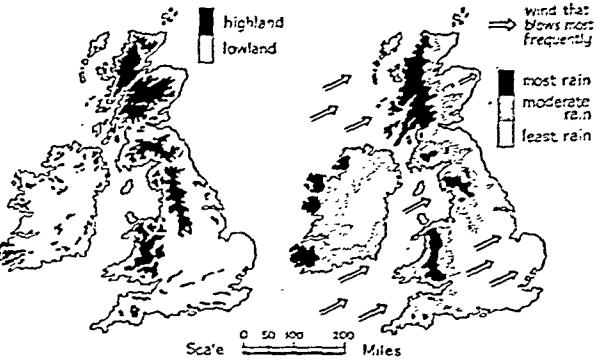
When the air cools, the water vapour turns back into drops of water. (On a cold day notice how water vapour from a hot bath turns into drops of water again when it meets the cold window pane.)

When the south-west wind reaches Britain it is forced to rise over the land. As it rises it cools, so bringing rain or drizzle to the west of Britain.

Look at these two maps and notice that most rain falls in the west and the least rain falls in the east.

Rainfall is measured in a rain gauge, which shows how many inches of rain have fallen in a certain time. Parts of the Lake District have as much as 120 inches of rain in a year. Parts of East Anglia have less than 20 inches in a year.

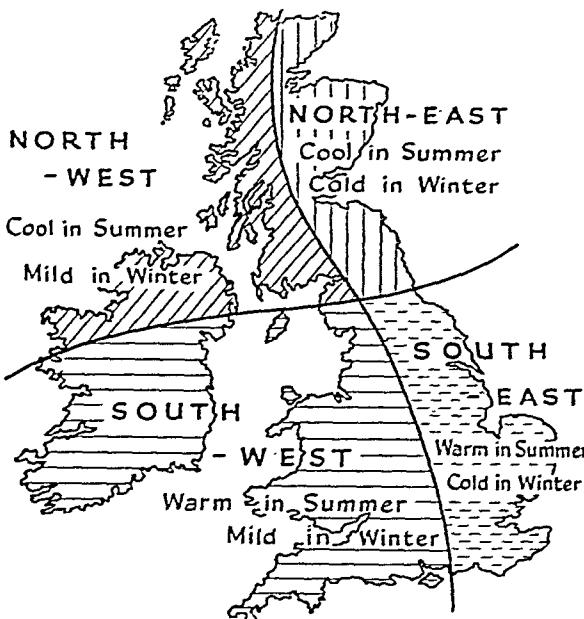
In winter, eastern Britain has drier and colder weather than the rest of Britain. East winds blowing from central Europe are very cold winds, for they come from lands which are far from the sea, and which have very cold winters. The cold east



The high land of Britain is in the north and west. That is where there is most rain

winds are dry too, for they have blown over land, not over sea.

In January the Scilly Islands usually have a temperature of 46° while East Anglia has less than 32° .



In summer the south of England is warmer than the north of Scotland, because the sun is more nearly overhead in the south. In July the south-west of England has a temperature of 62° while in the north of Scotland it is 55° . Farmers in Devon, Cornwall and the Scilly Isles grow early fruit and vegetables and sell them in cooler parts of Britain where the crops ripen later.

Many people go to the south-east coast for their holidays, because in summer this is usually the warmest part of Britain. East winds are warm winds in summer, because they are blowing from countries which have hot summer weather.

18. A FRUIT FARM IN KENT

London is the biggest built-up area in the world : over eight million people live there. Think how much food they need even for one day ! No wonder the farmers and market-gardeners around London, in the "Home Counties", grow as much fruit and vegetables as possible, to sell to the people of London and other large towns.

Mr Cook is one of the farmers who send their crops to London. His farm is in the Weald, a district of fine farmland between two ranges of chalk hills, the North Downs and the South Downs. In the Weald the soil is a rich loam (a mixture of sand and clay) which is very good for farming.

Mr Cook's farm covers 180 acres of land. (An acre is 4,840 square yards, the size of a square with sides about 70 yards long.)



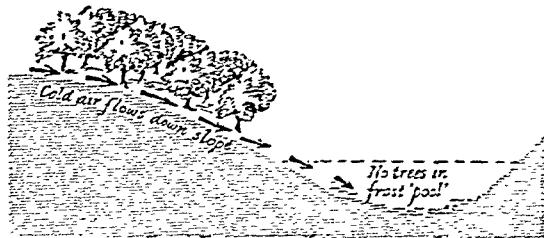
A saw, knife and secateurs, used for pruning



Cherry blossom time in Kent. The tall buildings are oast houses, in which hops are dried

This is how the farm is planned :

1. orchards of apples, pears, plums, cherries : 130 acres
2. hop gardens (the hops are used to flavour beer) : 20 acres
3. arable land (land which grows crops to feed the animals) : 10 acres
4. pasture for the sheep and bullocks, which provide valuable manure for the orchards : 20 acres



Trees grown on a slope are not harmed by frost, which flows down the slope

Nearly all Mr Cook's land slopes slightly to the south, facing the sun. This makes it warmer during the day and helps the fruit to ripen. The slope also helps to keep the trees free from frost, which is very harmful when the trees are in blossom.

How Mr Cook looks after his trees

If there is danger of frost when the blossom is out, before the fruit has "set", Mr Cook burns thick oil in the orchards. The smoke from the oil forms a "blanket" over the trees, and protects them by keeping in the warm air near the ground.



A blanket of smoke keeps in the warm air

The fruit trees are the most important part of Mr Cook's farm and he takes very good care of them. They need regular attention if they are to give good fruit year after year.

The orchards are regularly manured with chemicals, and by allowing sheep to graze between the rows of established trees.

If the fruit trees were allowed to grow naturally they would become so tall, and the branches so overcrowded, that the fruit would be small and difficult to pick. So in winter, while the trees are "sleeping", Mr Cook trims some of the branches and thins out the shoots. This is called *pruning*, for which he uses a saw, secateurs, and a special pruning-knife.



Pruning and spraying fruit trees in winter

Another winter job is spraying the trees with a poison called *insecticide*, to kill the pests and diseases which would injure the trees.

19. A MARKET GARDEN IN BEDFORDSHIRE

Mr Simpson's market garden is in Bedfordshire. It is really a small farm growing fruit, vegetables and flowers on every inch of its rich, heavily manured soil.



A picotee-edged carnation

Tomatoes

To have plenty of tomatoes in the summer, Mr Simpson must sow the seeds early in December. He sows them in shallow boxes and puts them in a hot glasshouse to germinate.

Eight weeks later the plants are planted out in a cooler glasshouse and tied to wires, so that they do not fall over. They are watered regularly, and given a special fertilizer. Mr Simpson's men take out the side shoots so that each plant grows only eight or ten trusses (or bunches) of good-sized tomatoes and reaches a height of six to eight feet.

The tomatoes are picked when they are just turning orange-red. They ripen quickly: in fact they will probably be red by the time the boxes arrive at the greengrocer's shop.



Working in a glasshouse, where hot-water pipes keep the air warm. Lettuces and tomatoes are being picked, and a cultivator is preparing the soil for the next crop

Part of Mr Simpson's land is covered by glasshouses which are heated by hot-water pipes. The plants which he grows in the glasshouses are watered regularly and can be kept much warmer than those out of doors, and so they grow well and ripen earlier.

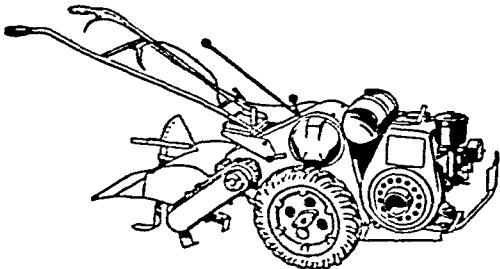


A tomato plant. The tomatoes at the bottom ripen first

Dwarf beans

Dwarf beans grow well in Mr Simpson's soil. The seeds are sown during May, in shallow furrows. As the plants grow they are weeded, and thinned. By mid-July the first beans are ready for picking, and more are ready every few days for several weeks until the frost comes.

Dwarf beans must always be picked while they are still young and tender



This rotary cultivator has a 5 h.p. engine. As the blades spin they break up the soil, to give a fine tilth

Flowers

Flower growing is an important part of the market gardener's business. He grows flowers which will travel well, without drooping, and which he knows are popular:



Some market gardeners grow fruit and vegetables for canning

friesias, carnations, daffodils, chrysanthemums and tulips. Many of the flowers are grown in glass-houses.

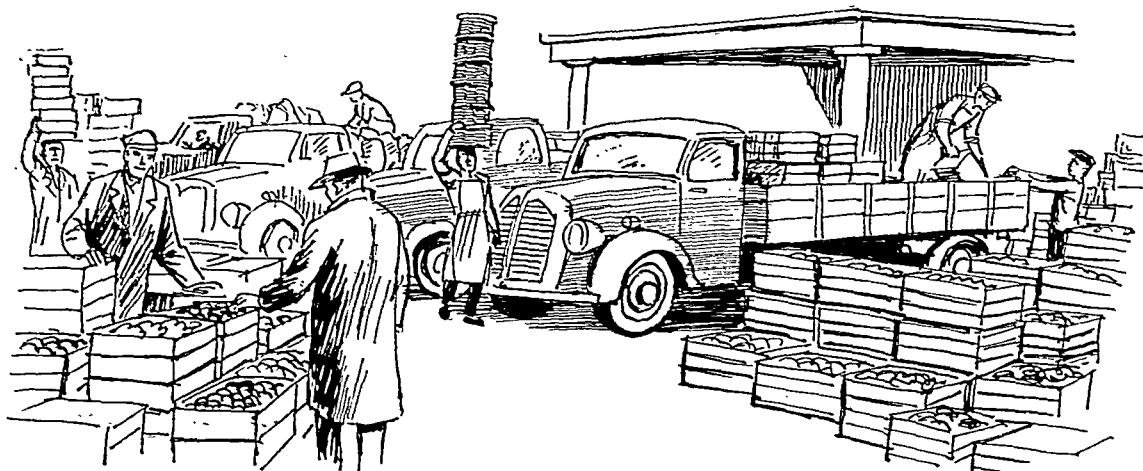
Lettuce

Mr Simpson grows winter lettuce in the glasshouse before the tomato plants go in. Later, he raises outdoor lettuces in rich soil where they will "heart up" well. In hot weather the lettuces are sprayed with water from pipes which are moved about the fields.

Selling the produce

Mr Simpson telephones the markets to find out in which town he can best sell his crops. Sometimes he is lucky, and just when there is a shortage at the market, he has a whole glasshouse full of tomatoes ready for picking. Sometimes he is unlucky, and he gets a poor price for his tomatoes, or cannot even sell them.

Some market gardeners grow their crops especially for sale to a canning factory, or to a quick-freeze factory.



At the market, fruit and vegetables are sold by the wholesale merchants to the retailers

Crops and flowers must be packed very carefully for market. Many growers now use plastic bags, and sometimes vegetables are washed and scraped ready for the saucepan.

Mr Simpson employs many skilled workers and so his weekly wage bill is high. At the busiest times of the year many of his vegetables are picked by "piece workers" who move from farm to farm, and are paid according to the amount they pick. For this reason they work very quickly and expertly and it pays the farmer to employ them.

You can see some of the workers in the colour picture. One girl is wheeling a truck load of carnations and tomatoes. Two others are picking dwarf beans. In the background lettuces are growing, and men are preparing the ground for the next crop.

Most market gardens are near to large towns, in places where the soil is good: in north Kent, in Lincolnshire, Middlesex, Lancashire and Worcestershire, as well as in Bedfordshire.

These lists show some crops grown by market gardeners. Many of these crops are also grown by farmers, and on allotments and gardens.

QUICK AND EARLY CROPS	CROPS WHICH TAKE LONGER TO GROW	ROOT CROPS WHICH CAN BE STORED	SOFT FRUIT	FLOWERS
Lettuces	Spring onions	Carrots	Gooseberries	Daffodils
Radishes	Cauliflowers	Potatoes	Raspberries	Carnations
Peas	Brussels sprouts	Parsnips	Strawberries	Gladioli
Dwarf beans	Cabbages	Turnips	Blackcurrants	Chrysanthemums

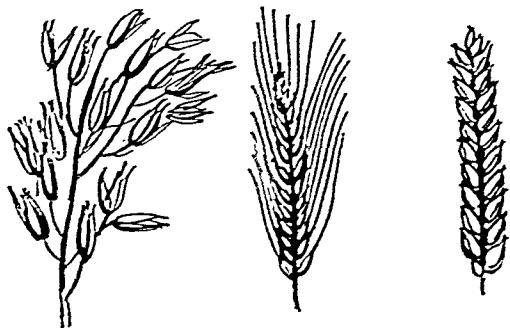
20. A MIXED FARM IN EAST LOTHIAN

Mr Wilson's farm of 260 acres is in the county of East Lothian in Scotland. The land is flat and easy to plough, but in this part of Britain the growing season for crops is fairly short, and the weather is never very hot.

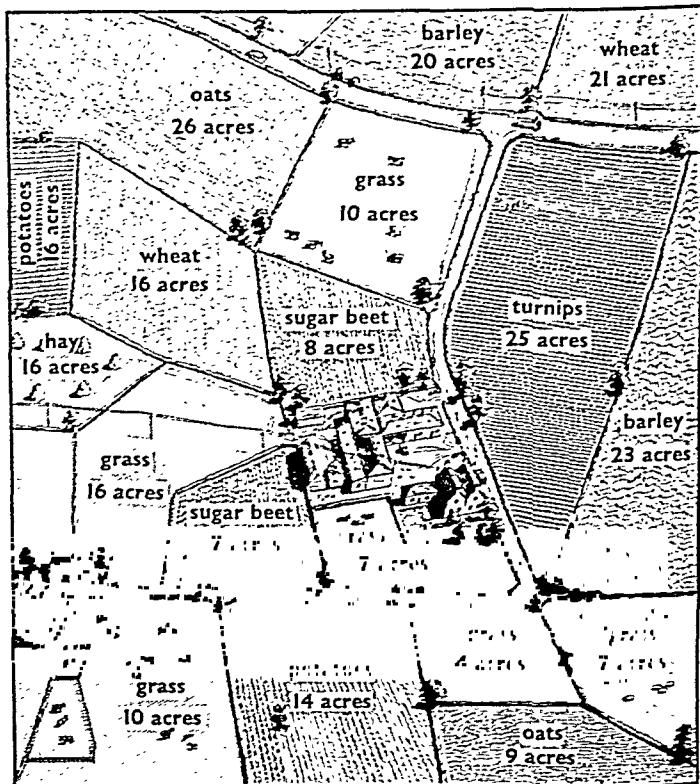
Mr Wilson grows crops in most of his fields, but he keeps livestock as well, and so his farm is called a "mixed" farm.

Planning the crops

If Mr Wilson grew only one crop, his workers would be very busy at seedtime and harvest and would have little to do for the rest of the year. But by planning the crops, the work on the farm can go on steadily all through the year.



Oats, barley and wheat



A plan of Mr Wilson's farm

Mr Wilson does not grow the same crop in the same field every year. Grain crops such as wheat, barley and oats quickly take the goodness out of the soil. So after a grain crop he grows grass and clover, or swedes. These are good for the soil and also make good fodder for the animals.

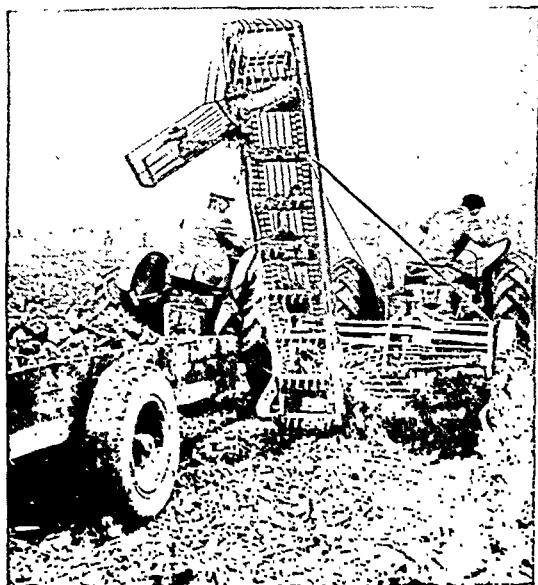
A six-year rotation

Changing the crops in a field is called "rotation". Mr Wilson has chosen a six-year rotation. The list at the top of the next page shows what happens in six of Mr Wilson's fields during one rotation period.

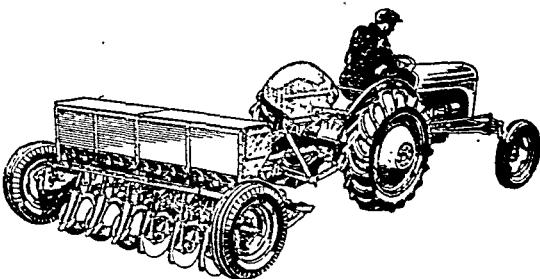
A SIX-YEAR ROTATION	26-ACRE FIELD	16-ACRE FIELD	21-ACRE FIELD	25-ACRE FIELD	20-ACRE FIELD	10-ACRE FIELD
1959	oats	potatoes	wheat	roots	barley	grass
1960	potatoes	wheat	roots	barley	grass	oats
1961	wheat	roots	barley	grass	oats	potatoes
1962	roots	barley	grass	oats	potatoes	wheat
1963	barley	grass	oats	potatoes	wheat	roots
1964	grass	oats	potatoes	wheat	roots	barley

THE CROPS

Mr Wilson is lucky to have a good loam soil on his farm: it is rich enough to grow grain and "stiff" enough for heavy-eared crops like wheat and barley to root well.



Harvesting sugar beet. This machine lifts the beet, shakes off the soil, "tops" and "tails" the beet, and loads them into a wagon



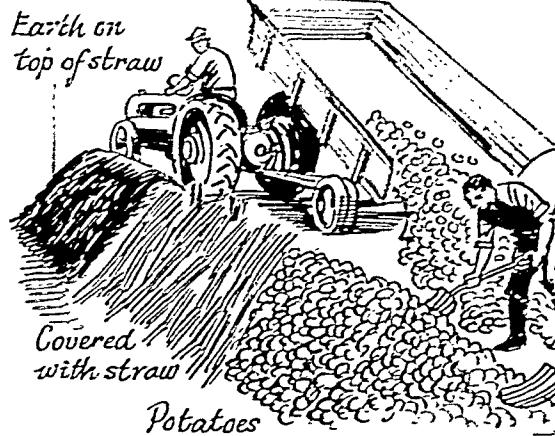
A tractor pulling a seed drill

Mr Wilson is growing oats in one of his fields this year. Let us see what happens in this field during the next six years.

First year : Oats

Mr Wilson sows the oats in March, and harvests them in August. Some of the oats go to the miller to be made into porridge oats, but most are needed as fodder for the sheep and cows during the winter. The straw, too, makes good fodder.

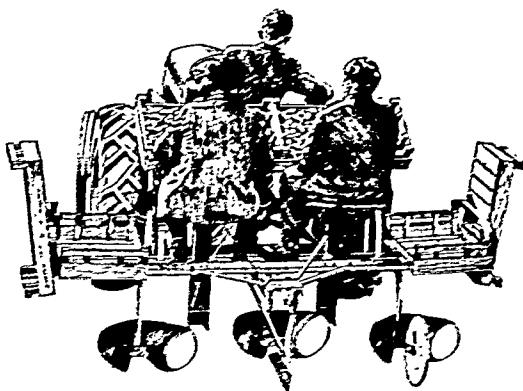
Oats are grown on most farms in Scotland, for they do not need as much sunshine as wheat or barley, and grow well even where there is much rain.



Potatoes in a clamp, under a covering of straw and earth

2nd year : Potatoes

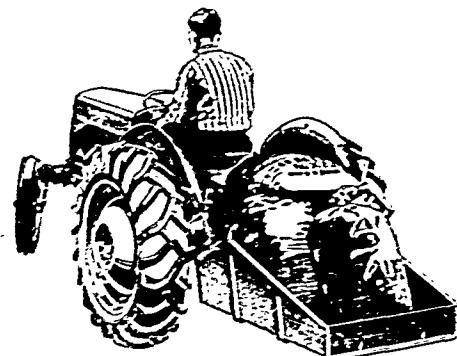
Mr Wilson ploughs the field twice to prepare it for planting the potatoes in the spring. They grow best in a loose well-ploughed soil. When the potatoes are harvested in October they are stored in the field in a clamp, under a covering of straw and earth. In the winter, when potatoes are needed at the market, the clamp is opened. Some potatoes are sold for eating, some are sold for seed. The smallest potatoes are fed to the pigs.



Sowing potatoes. The seed potatoes fall down the two tubes and are covered by the ploughshares

3rd year : Wheat

In November the land is ploughed, manured and sown with wheat. The wheat is ripe for harvesting in the following August. It is sold to a miller to be ground into flour for making bread. Wheat grows best in a heavy soil with plenty of sunshine.



This transport box can be fitted on to a tractor. It holds loads of up to 7 cwt

4th year : A root crop

The next year Mr Wilson grows root crops, such as turnips, swedes or sugar beet. The soil is ploughed and harrowed to break it up finely. While the root crop is growing it is kept free from weeds, and thinned, or *singled*, so that only good well-spaced plants are left.

Most of the turnips and swedes are dug up as they are needed, and fed to the animals. The rest are stored in clamps. Sugar beet are dug up in November, topped and tailed, and sent to a sugar refinery.

5th year : Barley

During the winter the field is ploughed and harrowed again. In March it is sown with barley. When the young shoots are a few inches high Mr Wilson sows grass and clover between the rows. These grow slowly, so that when the barley is cut, the grass and clover are only a few inches high. Then the sheep graze on the young grass. Some of the barley is fed to the animals. The rest is sold for making beer.

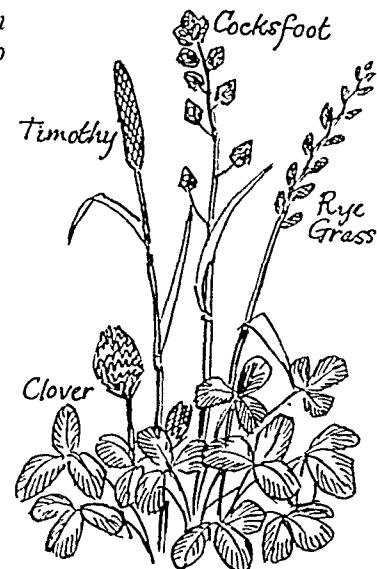
6th year : Grass and clover

The following spring the grass is cleared of stones and rolled. Then it is left to grow long and in June it is cut for hay. The sheep graze on the second growth of grass and then the field is ploughed before Christmas, ready to start the six-year rotation again with a crop of oats.

MR WILSON'S ANIMALS

Mr Wilson keeps a flock of fifty sheep. He fattens the lambs they produce by turning them out to

Mr Wilson
sows seed to
grow his
grass and
clover

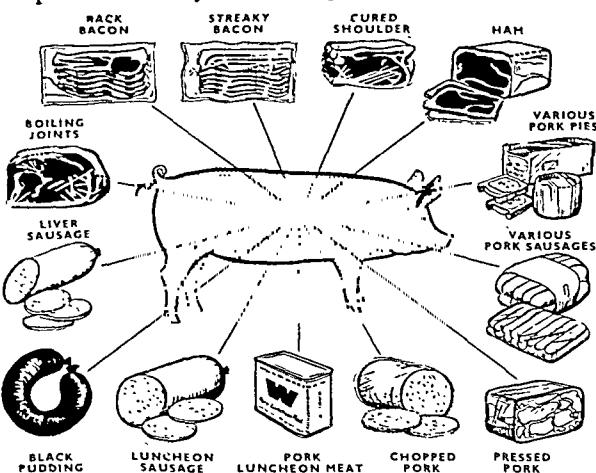


“fold” on the fields of turnips and swedes. By March, when the sheep are a year old, they are sorted, sheared and sent to market.

Twenty Friesian cows are kept for their milk. They are out in the field from May to October, but they spend the winter in a sheltered strawyard. During the winter they are fed on hay or silage, “roots” and dairy meal.

Mr Wilson buys his pigs when they are only a few weeks old. They are fed on barley and oats, and are sold to a nearby factory where they are made into bacon and ham.

Mr Wilson is just one of thousands of farmers in Britain who have mixed farms. Not all these farmers keep the same livestock or grow the same crops. But all of them try to make a living by growing crops to sell and to feed to the animals, and by keeping livestock which provide meat, milk—and manure.



21. SOME OTHER FARMS

Sheep farming

Sheep are very useful for they give us wool as well as meat, and even on poor land they can find enough to eat. Many sheep graze on the limestone hills of southern England, especially in Hampshire, where the grass is short and wiry. Hardier breeds are kept on hill and moor where the soil is thin and the weather is often cold. There are many sheep on the Southern Uplands of Scotland, in Wales, in the Pennines, and in the Lake District.

Beef farming

Do you know why "the roast beef of Old England" is so famous? It is because fine beef cattle are fattened on the rich pastures in the



Sheep in folds, feeding on kale

west of England and in the Midlands. In these parts there is enough rain to make the grass grow well.

Pig and poultry farming

Pigs are kept to make ham, pork and bacon, and hens for their eggs or for eating. Pigs and hens can be reared on the poorest land if it is not too wet. Many are kept by smallholders near towns, where it is easy to obtain swill for feeding them.

Arable farming

Arable farms grow the crops which we eat: wheat for bread, oats for porridge, barley, potatoes, etc. Most arable farms are on the flat lowlands of eastern England and Scotland, where the soil is good and there is less rain than in the west. In north-east Scotland oats and turnips are the main crops. Further south, where the weather is milder, crops such as wheat, barley, sugar beet, and potatoes are grown.



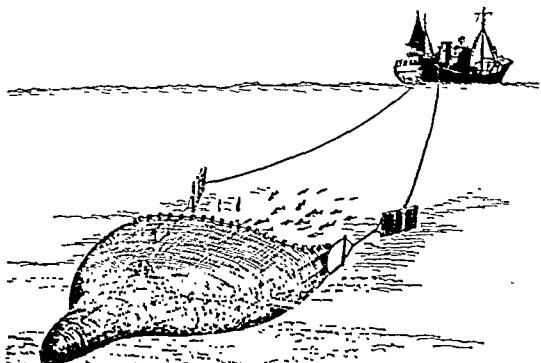
Feeding pigs with barley meal and swill

22. FISHING

Britain is surrounded by shallow seas. In these seas fish thrive, because there is plenty of food for them to eat. They live on smaller fish, or on plankton, which consists of tiny sea creatures and plants.

This map shows the main fishing grounds in the seas around Britain. But the fish do not stay in one place all the time. They move about during the year, and the skipper of a fishing boat has to judge where the fish are likely to be. Often the skipper uses radar to help him to find the fish.

Some of the fish, such as cod, haddock, plaice and sole, live near the bottom of the sea, where they find their food. Other fish, such as herring and mackerel, live and feed near the surface of the sea.



A trawler pulls its net along the sea bed



Fishing grounds in the seas around Britain

Trawler fishing

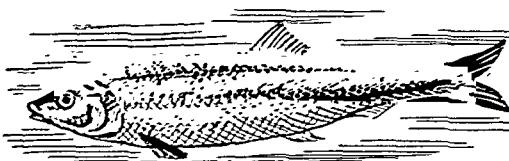
The fish which swim near the bottom of the sea are usually fished for by boats called *trawlers*. These boats pull a net, shaped like a bag, along the bed of the sea. Once the fish are in the net they cannot escape.

Some trawlers sail as far as Iceland and the north of Norway, braving icy seas and stormy weather. They are often at sea for three weeks at a time, and the fish caught on one trip may be worth as much as £10,000. The fish are packed in ice to keep them as fresh as possible.

Some trawlers fish in the North Sea and to the north-west of Britain.

Fishing with lines

Some of the bigger fish swimming near the sea bed, such as cod and halibut, are caught by boats called "great-liners". These boats put out long lines with hundreds of hooks on them. The hooks are baited with pieces of fish. When the line is lifted the cod and halibut are taken off and the hooks are rebaited. "Great-liners" fish for halibut on the rocky sea bed, in places where a trawl net cannot be used because it would be damaged.



A herring

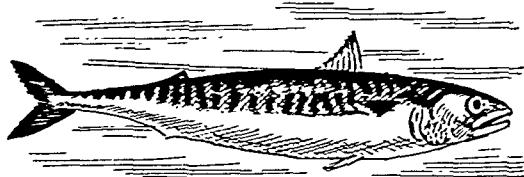
Drifters

Fish which swim near the surface are caught by *drifters*, and smaller boats. The drifters put out nets which hang in the water like big tennis nets. The top of each net is held up by coloured buoys, and the bottom is kept down by a heavy

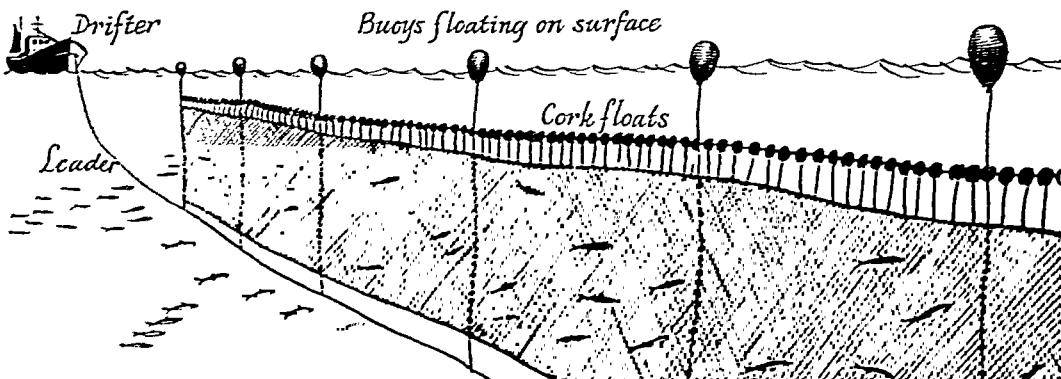


Baiting the hooks on a "great-liner"

rope called a *leader*. One boat may put out a "fleet" of as many as eighty nets. The nets have a mesh which is wide enough to let the small fish through. But as the larger fish try to swim through the net they catch their gills in it and cannot escape. Herring and mackerel are caught by drifters.



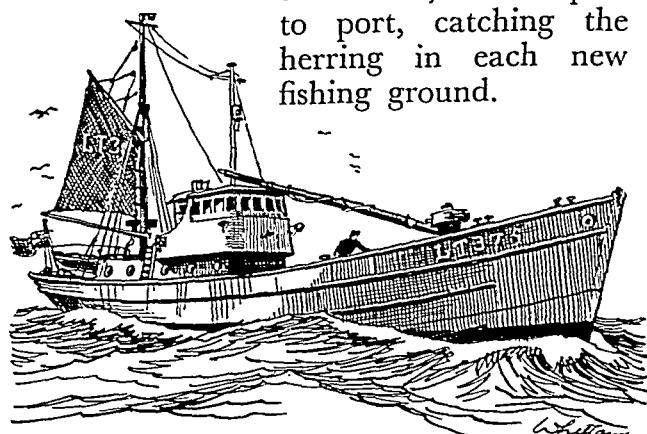
A mackerel



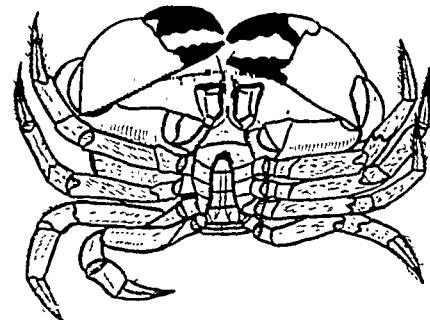


The herring fishing grounds and their seasons

Herrings swim in shoals, thousands of them together, so they are easily caught in drift nets when they come to the surface to feed. The shoals appear round the coast of Britain at different times of the year. The drifters gradually move down the coast, from port to port, catching the herring in each new fishing ground.



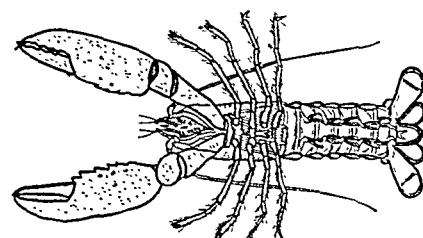
A drifter from Lowestoft



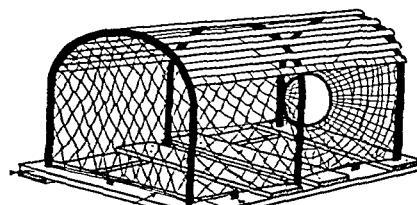
A crab (the underside)

Fishing near the coast

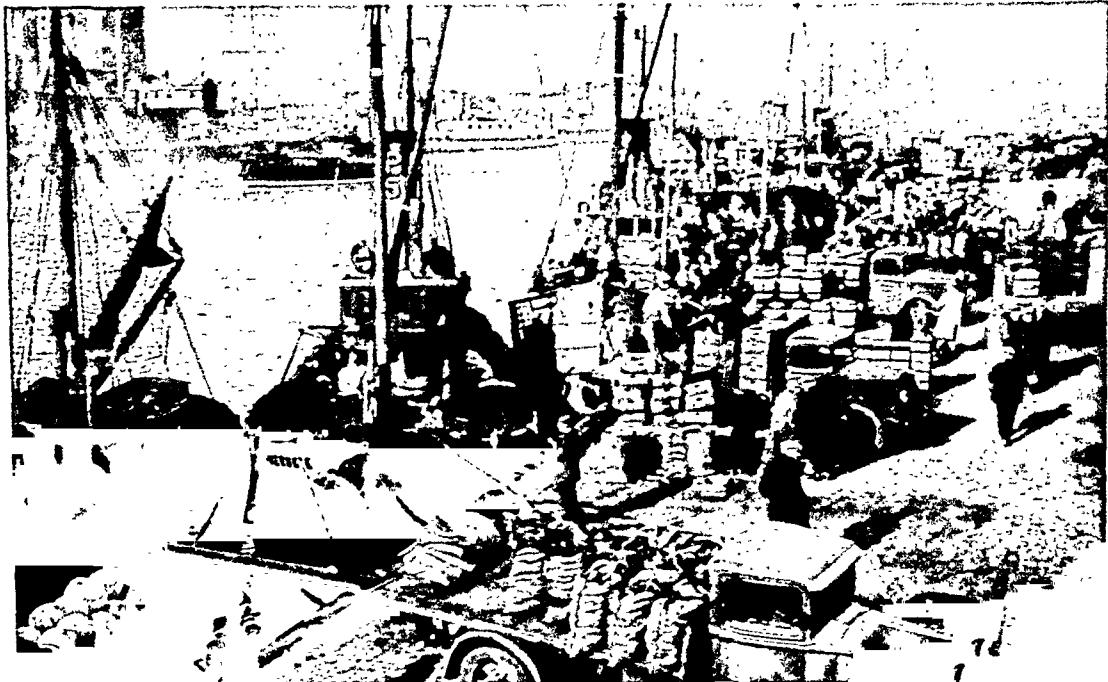
All round our coast there are many small fishing ports. From these ports small fishing boats go out almost every day. These "inshore" boats rarely go out of sight of land or are away from home for more than two days. They use nets and lines to catch fish, and lobster pots to catch "shell fish", such as lobsters and crabs.



A lobster (the underside)



A lobster pot, half-made. The lobsters go in through the funnel-shaped hole, and cannot get out



Drifters unloading their catch at Yarmouth. In the foreground, coal is being taken aboard one of the boats. But most modern drifters have diesel engines, which burn oil.

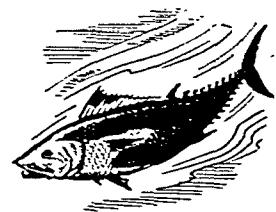
Landing and selling the fish

Most trawlers dock, and unload their fish, at Hull and Grimsby on the estuary of the River Humber, at Aberdeen in Scotland, or at Fleetwood in Lancashire. Many drifters land their fish at Lowestoft and Yarmouth in East Anglia.

At the port the fish is quickly sold, packed in boxes with ice to keep it fresh, and loaded into lorries or insulated railway wagons. Sixty fish trains leave the ports every afternoon, carrying the fish to markets in towns and cities all over Britain. Billingsgate, in London, is a famous fish market where whole-

sale fish merchants sell the fish to the fishmongers and to the fried-fish shops.

A tunny fish

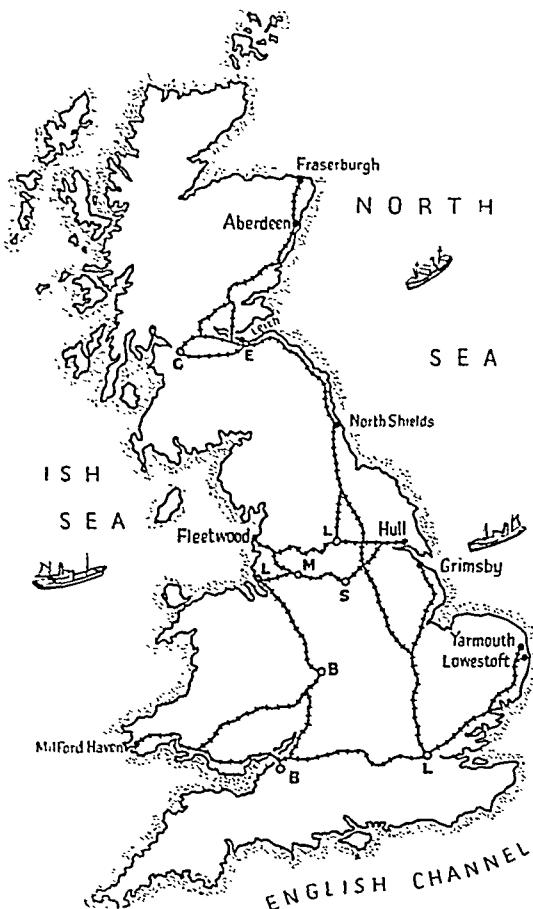


On the opposite page is a map of the main ports where fish is landed. The map also shows some of the railway lines along which the fish trains run.

Only the first letters are given of the names of some of the largest cities. Can you name the cities?

Here are a few of them :

boat builders
box makers
lorry drivers
canning factory workers
workers in fish and chip shops
Billingsgate porters



The main ports where fish are landed, and the railway lines which carry the fish to the big cities. Which cities are shown?

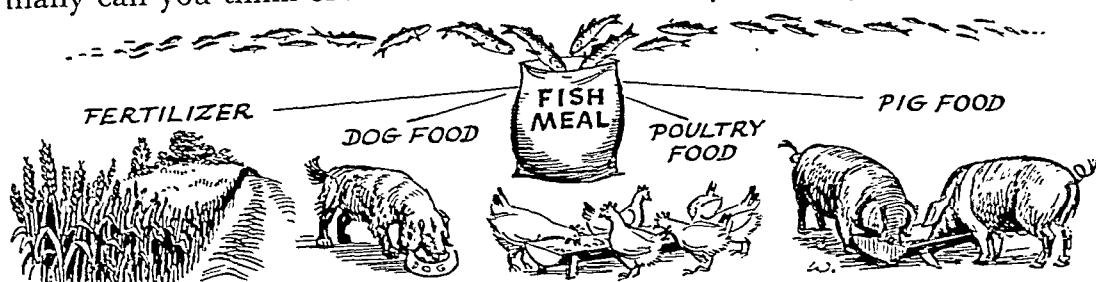
As well as the fishermen, there are many people whose work has a good deal to do with fish. How many can you think of?

Preserving fish

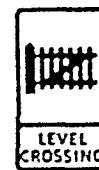
Sometimes, in winter, the seas are so stormy that the fishing boats cannot leave harbour. A few years ago this would have meant that there would be no fish in the shops.

But nowadays, when the boats bring in more fish than can be sold in the shops, some of it is "quick-frozen" and stored until it is needed. The factories preserve fish in many other ways. Some is canned ; herrings are split, gutted, washed and hung in the smoke from burning wood-shavings to make kippers ; some cod is salted and sent to South America and Southern Europe.

Even if the fish cannot be sold for eating, it is not wasted. It can be steamed to make fish meal, which has many uses, as you can see below.



Some of the many uses of fish meal



Some signs which help to make the roads safer. Can you think why each of these signs is needed?

23. TRANSPORT AND TRAVEL BY ROAD

Bert is a long-distance lorry driver. His depot is in London and he often drives to Glasgow, which means that he is away from home for three nights out of four. It is a hard, lonely life, but he is well paid and he enjoys driving.

When loaded, his lorry weighs about 25 tons. It is 30 feet long, and has a canvas cover to keep the load dry.

The journey from London to Glasgow

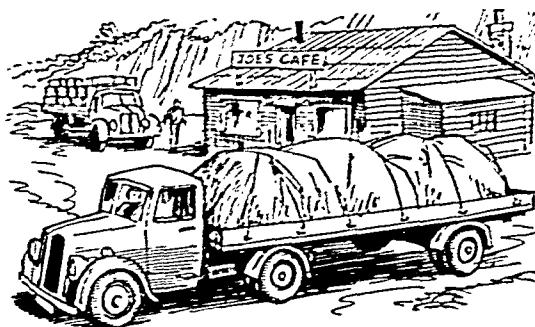
When Bert sets off, the roads are still crowded with cars and vans, but he knows that as the night goes on there will be less and less traffic, until only the heavy lorries are on the road. The lorry drivers help each other by signalling with their



Inside a transport cafe

lights to tell when there is danger ahead, or when it is safe to overtake.

Bert knows his route well, and he keeps to the main roads. He is glad that the roads have "cat's eyes" in the middle to reflect the light from his headlights. They make it easy to drive at night, and are a great help when it is foggy.



An articulated lorry

Every few hours Bert stops at a "lay-by" for a rest, or pulls into an all-night transport café. There he chats to other drivers, and has a meal before setting off again.

By morning Bert has driven about two hundred miles in twelve hours and he pulls up at a transport hostel near Wigan in Lancashire. Here he has breakfast and goes to bed.

Bert wakes up late in the afternoon, has dinner, fills up the lorry's tank with a special fuel oil called "Derv", and sets off again.

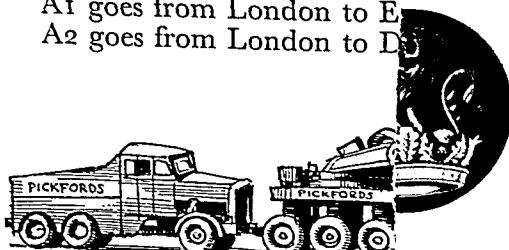
The journey between Lancashire and Glasgow is often difficult in winter. There are hills to climb and the weather is more severe on high ground. The roads are often icy or snowbound. When Bert reaches Glasgow he drives to the depot and delivers his load. He stays the night in lodgings in Glasgow and returns to the depot the following evening to drive his lorry, with another load, back to London.

There are hundreds of lorry drivers at work all over Britain, driving all kinds of lorries. The lorries carry goods quickly, without much handling, and this helps to keep down the cost of the things which they carry. (The cost of a thing in a shop depends partly on the cost of transporting it to the shop.)

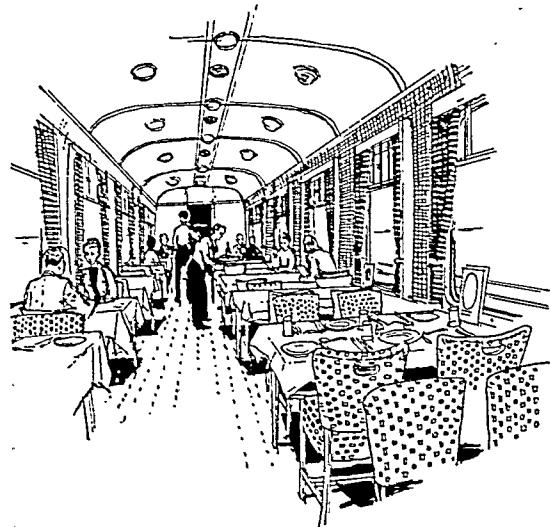
Britain's roads

The most important roads need called "A" roads. Roads wagons so important are called "E"

A1 goes from London to E
A2 goes from London to D



This Pickfords' trailer, used for badge of pushing. The trailer has 24 wheels.



A dining-car on an express train

RAILWAYS

Making up the goods trains

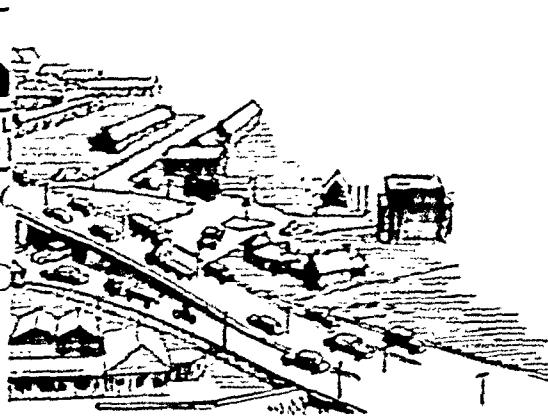
A3 goes from London to Portsmouth
A4 goes from London to Bristol
A5 goes from London to Holyhead
A6 goes from London to Carlisle
A7, A8 and A9 begin in Edinburgh

Some of the "A" roads are fine modern roads with room for four or are taken to a large goods yard called a *marshalling yard*. There they are sorted again. An engine pushes the wagons over a hill or hump. As each wagon runs down the other side of the hump a man in a control tower changes the points, so turning the wagon on to the right line.

When the trains are complete, engines pull them out of the marshalling yard and take them on their way. There are large marshalling yards at Toton, near Nottingham, at March (Isle of Ely), and at Crewe.



Some signs which help to make the roads safer.



23. TRANSPORT AND TRAVEL

Bert is a long-distance lorry driver. His depot is in London and he often drives to Glasgow, which means that he is away from home for three nights out of four. It is a hard, lonely life, but he is well paid and he enjoys driving.

When loaded, his lorry weighs about 25 tons. It is 30 feet long, and has to go through such busy towns as Rochester, Doncaster and St. Albans.

In some places, where two very busy roads cross each other, "fly-over junctions" are being built. Some roads which are dangerously on there will be less and less traffic, until only the heavy lorries are on the road. The lorry drivers help each other by signalling with their



Inside a transport café

From London to Oxford, over another main road

narrow are being widened, and new "motorways" are being built to carry fast traffic and to keep it away from towns.

Crossing wide rivers

Wide river estuaries, which cannot easily be bridged, often make a road go far inland. Instead the road may go under the river in a tunnel. The Mersey Tunnel carries 30,000 vehicles a day between



Birkenhead and Liverpool.

Many fine new roads and bridges have been built. But what will happen in ten years' time?

Every time? Will there be so many cars and lorries that even the fine new roads will not be able to carry them? Should a law be made that "all heavy

goods must be carried by rail", to leave the roads free for cars, buses and vans?

Suburban trains, which carry "rush hour" passengers, are designed to carry as many people as possible. Long-distance trains are more comfortable, with dining-cars where meals are served. Some have sleeping-coaches fitted with bunks.

The main lines

Main lines link London with all parts of the country. There are two main routes from London to Scotland, one east of the Pennines via Peterborough, York and Newcastle, the other west of the Pennines via Crewe, Preston and Carlisle. Trains for Holyhead and North

Wales branch off the western

British

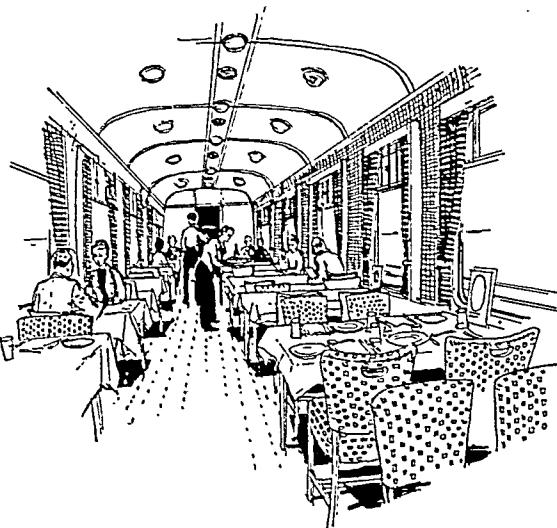
Goods trains

A railway train is usually the best way of transporting heavy goods, for one goods train can carry the same load as fifty transport planes, or a hundred lorries. Whole train-loads of coal are taken from the mines to the factories, and train-loads of iron ore go from the docks to the steelworks. These trains need no sorting because all the wagons are going to the same place.

But many goods trains are made up of different wagons carrying all kinds of goods. When a wagon is loaded, it is put with other wagons going to the same part of the country.



The badge of
British Railways



A dining-car on an express train

BRITISH RAILWAYS

Making up the goods trains

In every large town in Britain there is a railway goods yard. At the yard, wagons are sorted into trains by a shunting engine which pushes them from one line to another.

Wagons going for long distances are taken to a large goods yard called a *marshalling yard*. There they are sorted again. An engine pushes the wagons over a hill or hump. As each wagon runs down the other side of the hump a man in a control tower changes the points, so turning the wagon on to the right line.

When the trains are complete, engines pull them out of the marshalling yard and take them on their way. There are large marshalling yards at Toton, near Nottingham, at March (Isle of Ely), and at Crewe.

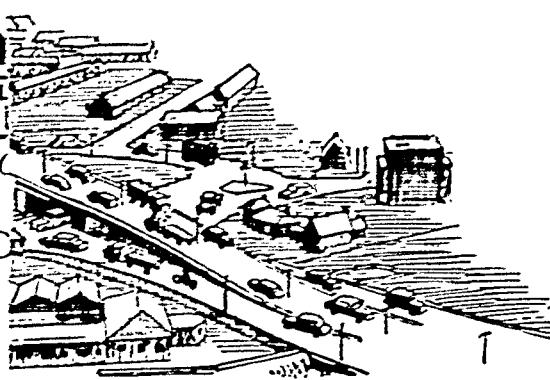
30



Some signs which help to make the roads safer.

23. TRANSPORT AND TRAVEL

Bert is a long-distance lorry driver. His depot is in London and he often drives to Glasgow, which means that he is away from home for three nights out of four. It is a hard, lonely life, but he is well paid and he enjoys driving.



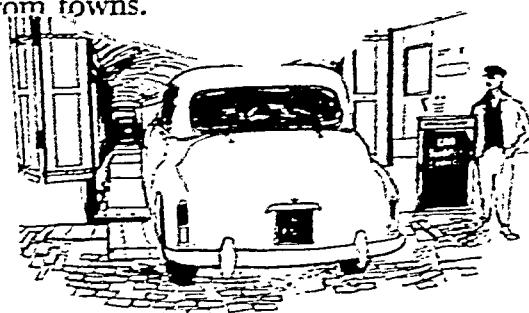
From London to Oxford, over another main road

narrow are being widened, and new "motorways" are being built to carry fast traffic and to keep it away from towns.

Many towns are already fitted with automatic brakes so that they can safely travel as fast as passenger trains.

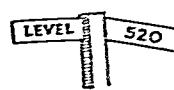
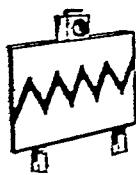
Different wagons for different loads

Because goods trains carry so many different loads, there are many different kinds of wagon. More than half the wagons are open steel wagons for goods such as coal or iron ore which are not harmed by the weather. Goods which need protection from the rain go into covered wagons. Cattle trucks have a grille to let in light and air, and liquids are carried in tanks.



Cars are carried on some long-distance trains

For a long journey a train is often the quickest and most comfortable form of travel. Trains are also useful because they carry so many people. About three million people travel on British Railways every day. Half of these people are workers in London, Glasgow, South Lancashire and Birmingham, who travel to and from work on the "rush hour" trains. Some trains hold as many as 1,000 passengers. Think how many buses and cars would be needed to carry all these people!



Railway signs to help the engine driver

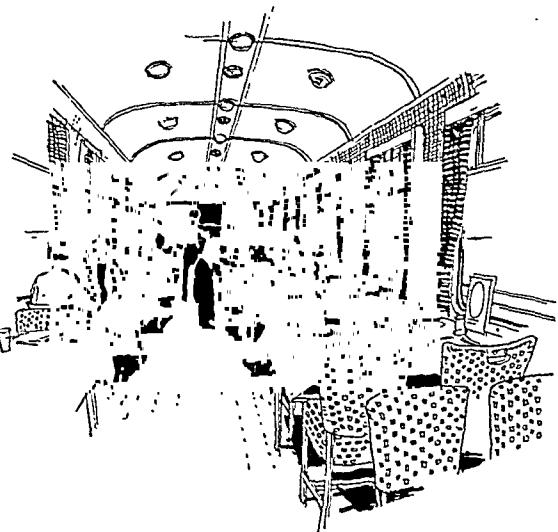
The signs mean: a water trough ahead; a slope of 1 in 520; a speed limit of 50 m.p.h.

Suburban trains, which carry "rush hour" passengers, are designed to carry as many people as possible. Long-distance trains are more comfortable, with dining-cars where meals are served. Some have sleeping-coaches fitted with bunks.

The main lines

Main lines link London with all parts of the country. There are two main routes from London to Scotland, one east of the Pennines via Peterborough, York and Newcastle, the other west of the Pennines via Crewe, Preston and Carlisle. Trains for Holyhead and North Wales branch off the western route at Crewe. Trains to South Wales go via the Severn Tunnel; for Devon and Cornwall trains go via Taunton or Salisbury to Exeter, Plymouth and Penzance. South-east England is well served by frequent electric trains to and from London.

Several main lines link east and west Britain. There is a diesel-electric service between Glasgow and



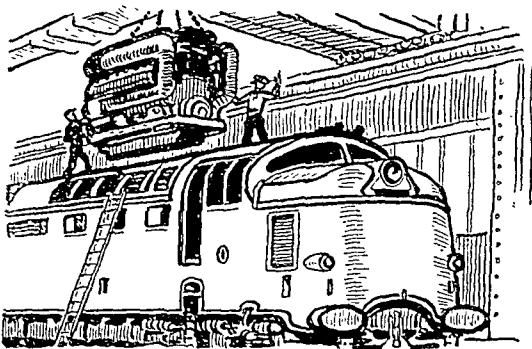
A dining-car on an express train

Edinburgh. Fast trains run from Manchester to Liverpool and to Sheffield and through the gap made by the river Aire, from Leeds to Carlisle. But in most of Britain it is much easier to travel north and south than to travel east and west.

Railwaymen and railway towns

To keep the railways in good condition a large number of people are needed, working in the goods yards and stations, looking after the track, or working as signalmen, cleaners, firemen or drivers. There are some railwaymen in nearly every town in Britain.

At some places where the main lines meet there are large workshops where engines, carriages and wagons are built and repaired: Darlington, Crewe, Swindon, Doncaster, Derby and Ashford are some of these places.



Lowering the engine into a diesel locomotive

L.W.—16

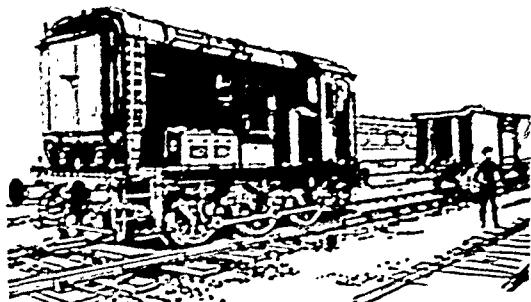
Modern locomotives

Since steam engines were invented, a hundred years ago, coal has been the main source of power.

But gradually the steam locomotive is being replaced by three other kinds of locomotive.

A *diesel locomotive* has a powerful oil engine, and is very useful for shunting.

A *diesel-electric locomotive* has an oil engine which drives a generator. This makes the electricity needed to drive the locomotive. Diesel-electric locomotives are used for pulling main-line trains.



A diesel locomotive, used for shunting

some lines are being electrified, and diesel locomotives are being used on the others. No more steam locomotives are being built. But steam engines are still the most common, and it will be many years before the last steam locomotive is scrapped.

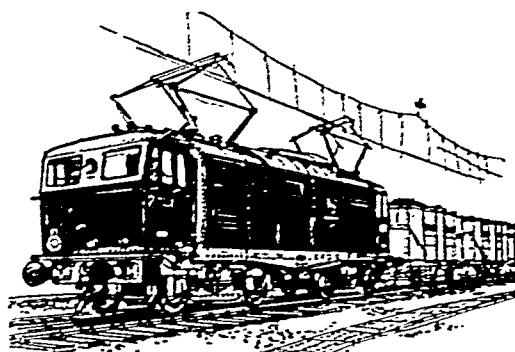


A diesel-electric locomotive

An *electric locomotive* takes its power either from an overhead wire or from a third rail on the ground. It is useful for suburban lines, where the stations are close together, for it can start and stop very quickly.

Modernising the railways

The best plan would be to electrify all the main lines at once, but this would be far too costly. Instead



An electric locomotive which takes its power from an overhead wire

Air traffic control

With so many planes flying over Britain it may seem surprising that planes hardly ever hit one another in mid-air. But no pilot can choose his own course. Instead an Air Traffic Control Centre tells him at what height, and by what route, he must fly. Every civil airliner is controlled from the moment its engines are started until its journey is complete. London is the control centre for Southern England, and Prestwick for Scotland and the Atlantic Ocean.

The airlines of the world

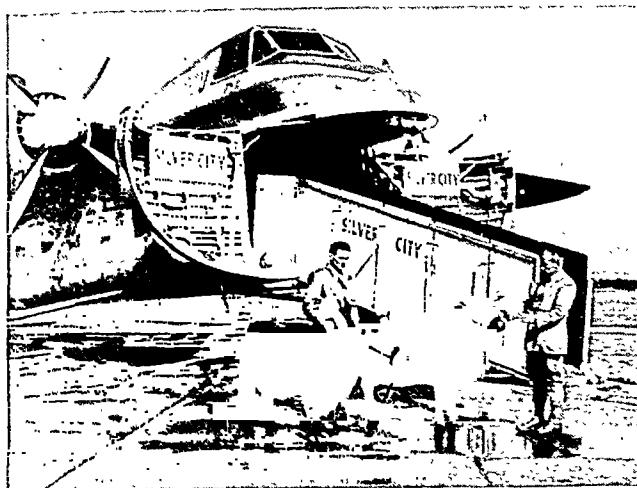
British European Airways (BEA) and British Overseas Airways Corporation (BOAC) are Britain's main airlines. BEA planes fly to nearly seventy different airports in Britain, Europe and North Africa. BOAC operate services to the Far and



Loading mail bags into an airliner. Most airliners carry mail as well as passengers

Middle East, to Africa, Canada and North and Central America.

All these are regular flights, keeping to a timetable. There are other companies which transport cars for holidaymakers, and make special or "chartered" trips, carrying groups of people such as employees of British companies. Their fares are usually cheaper than the regular airline fares.



Loading cattle into a transport plane

Transport planes

Passenger planes carry mail and cargo, as well as passengers. Other planes carry only cargo. Goods which perish quickly, like tropical fruits, or cargo which would be harmed by a long sea voyage, like delicate machinery, race-horses, or animals for the zoo, are sent by air. All cargo is weighed and then carefully stowed so that it does not upset the balance of the plane.

26. THE REGIONS OF BRITAIN

If you look at a map of Britain in an atlas you will see that it is coloured. On some maps the counties are given various colours, so that you can easily see them. But on a physical map of Britain the land is coloured to show how high it is above sea level. High land is brown and low land is green. In Britain, most of the high land is in the north and west. In the middle of England, and in the east and south, the land is much lower. Some of the low land has small hills, but all this land is less than 600 feet above sea-level.

The height of the land in the different parts of Britain helps to give each part its particular scenery. In some places there are flat plains. In other places there are wide river valleys, gently curving hills, high moorland, or rugged mountains.

According to the different kinds of scenery, we can divide Britain into different parts. But if we take into account other things as well, Britain can be divided into *regions*, each of which has its own character.

Here are some of the things which help to divide Britain into regions :

The *height of the land*—is it high-land, upland or lowland?



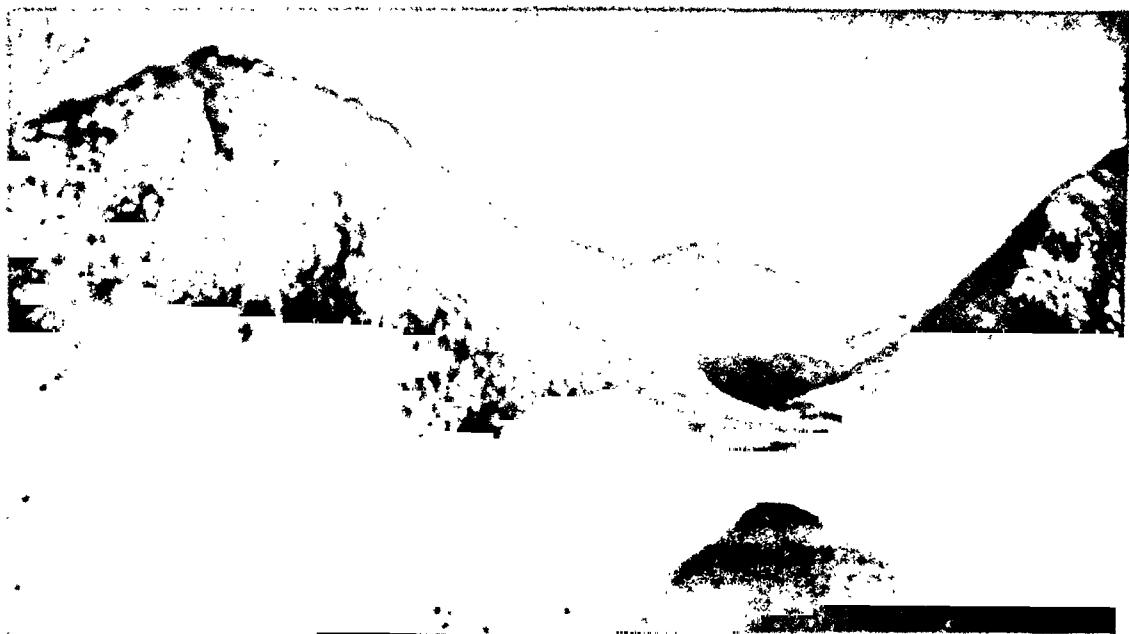
One way of dividing Britain into regions

The *weather*—how much rain falls?
Is it a warm or a cold part of Britain?

The *natural resources*—can coal or iron ore be mined there?

The *soil*—is it good for growing crops?

The map on this page shows one way of dividing Britain into regions.



1. *A Part of Glencoe, in the Highlands of Scotland*



2. *A shipyard in the Central Lowlands*

SCOTLAND

1. The Highlands

Most of this part of Scotland is made up of very old hard rock, which has stood up to centuries of wind, frost, sun and rain. The mountains are craggy, the soil is poor and thin, and the rainfall is heavy. Farming is very difficult, but some hillsides have been planted with trees. In some valleys hydro-electric power stations have been built. In the east there is some lowland which is good for farming.

2. The Central Lowlands

Four-fifths of the people of Scotland live in this wide valley. The land is good for farming, coal is mined there, travel is easy, and there are deep sheltered estuaries. Many people who live in the Central Lowlands work in factories.

3. The Southern Uplands

This part of Scotland is not as high or as rugged as the Highlands. As on most high land in Britain, sheep are reared for mutton, and for their wool. On the lower land there are dairy farms. The Uplands join the Cheviots, a range of hills which divides Scotland from England.

ENGLAND

4. The Lake District

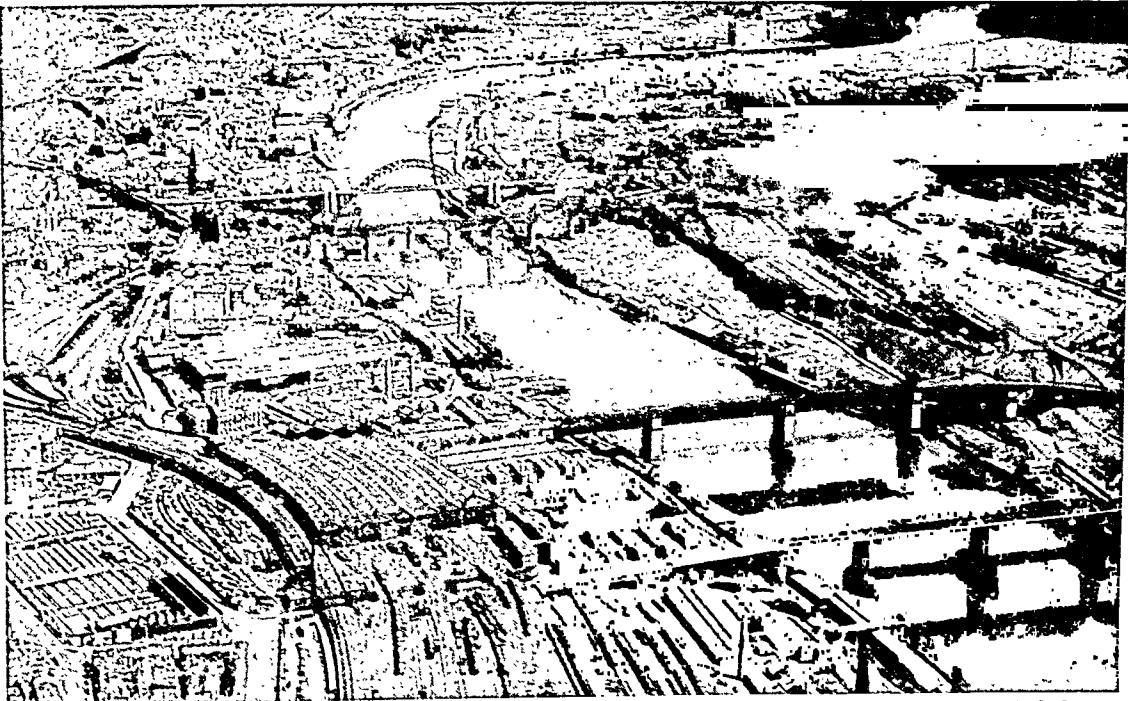
This is a lovely area of rounded mountains, with forested slopes and beautiful lakes. Many of the people who live there earn a living by looking after the climbers, walkers and anglers who go to "the Lakes" for a holiday.



3. Sheep on the Southern Uplands



4. Hikers near Derwent Water, in the Lake District



6. Newcastle, on the River Tyne. On the right bank is County Durham, on the left is Northumberland

5. The Pennines

This range of hills forms a natural barrier between Yorkshire and Lancashire. The roads and railways follow the valleys through the hills, but even so it is still possible for travellers to be snowbound in winter. Streams from the Pennines provide soft water for the cotton mills of Lancashire, and the woollen mills of Yorkshire. The Pennines reach well down into England, as far as the Peak District of Derbyshire.

9. North-East England

Here there is a large coalfield, with many factories, mines, shipyards and docks. Little land is left for farming.

5. Woodhead tunnels, under the Pennines

7. Yorkshire

The Vale of York is a rich plain, where good crops are grown. In South Yorkshire there are many coal mines, steel works and factories:



8. Lancashire and Cheshire

In Lancashire there is a large coalfield. The busy ports of Liverpool and Manchester serve the factory towns on the River Mersey and the cotton towns north of Manchester. Market gardeners in south and west Lancashire grow vegetables for the people of the towns. Dairy cows are kept on the rich pastures of the Cheshire plain.

9. The Midlands

Most of the people live and work in the factory towns, particularly in Birmingham and the "Black Country". But all over the Midlands



8. Two swing bridges on the Manchester Ship Canal, one carrying a road, the other a canal

there is good farmland where cattle are reared, sheep graze, and much fruit is grown. This is one of the most prosperous parts of Britain.



9. The view from the tower of Hanley Parish Church in the Potteries, before the Clean Air Act (1956) came into force



10. Large machines can be used on the rich, flat farm land of East Anglia

10. East Anglia

Heavy crops of wheat and sugar beet are grown on the good flat farmland of East Anglia. Around the Wash is an area known as the Fens, much of which has been reclaimed from the sea. It has dark, rich soil. The Broads, a series of lakes joined by rivers, between Norwich and Yarmouth, are very popular with people who like boating holidays.

11. The West Country

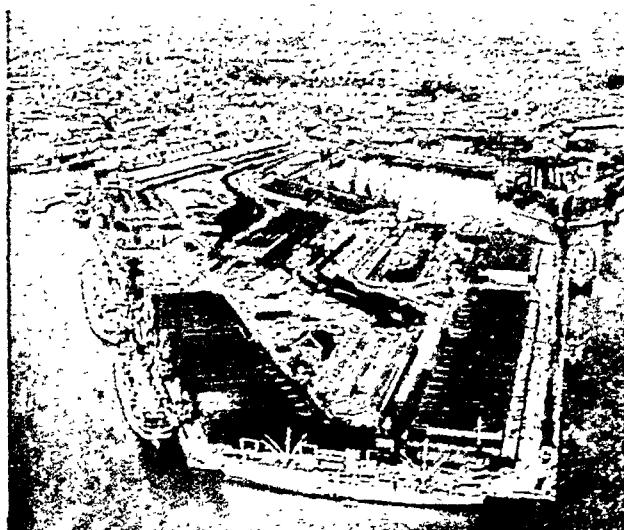
The high moors, Exmoor, Dartmoor and Bodmin Moor, are bleak and almost uninhabited. On the lowland the weather is mild, and early vegetables and flowers are grown in the sheltered valleys and sent to London and other large towns. Round the coast there are many small fishing ports.



11. Picking daffodils on the Cornish coast

12. Southern England

Much of this part of England was once covered by forest. Today the only large forest is the New Forest, between the great port of Southampton and Bournemouth, a large holiday resort. Soldiers are trained on Salisbury Plain, where the soil is sandy and only scrub and poor trees will grow. Sheep are kept on the uplands and dairy cattle on the meadows in the valleys.

12. *The docks at Southampton*12. *A cottage in a Cotswold village*

13. London

Dozens of towns and villages have grown and gradually joined together, to make the huge built-up area known as Greater London. Hardly any open space is left. Over eight million people live there, and the built-up area stretches for twenty miles from north to south and twenty miles from east to west.

13. *London. The Houses of Parliament, seen across the River Thames. To the right are the pointed towers of Scotland Yard, and Westminster Bridge*

LET'S REMEMBER PART 3

Here are some facts and figures about Britain.

The British Isles

The British Isles are a group of islands lying off the north-west coast of Europe. The largest island is Great Britain, made up of England, Scotland and Wales. The next largest island is Ireland, made up of Northern Ireland and the Republic of Ireland. There are many smaller islands.

The United Kingdom of Great Britain and Northern Ireland is made up of England, Scotland, Wales and Northern Ireland.

The high land

Most of the high land in Britain is north and west of a line drawn from the mouth of the River Exe, in the south-west, to the mouth of the River Tyne, in the north-east. Rainfall is heaviest in this high land.

Distance

From London to the most northerly point on the mainland of Scotland is 500 miles.

Natural resources

Britain's only natural resources are coal, a little iron ore, a little water-power, and fish.

Power

Coal is still our main source of power, but gradually its place is being taken by oil, hydro-electricity, and atomic power.

Industry

The eight main industrial areas are : the Central Lowlands of Scotland, the north-east of England, South Lancashire, South Yorkshire, the Midlands, South Wales, London and Belfast. Of these eight areas, only two—London and Belfast—are not on a coalfield.

Farming

The highest land cannot be farmed. Sheep graze on the uplands. Crops are grown and cattle are kept on the lowlands.

Imports and exports

The farms of Britain can provide only half the food needed in Britain ; the rest must be imported. Raw materials for the factories must also be imported. To pay for these imports, manufactured goods must be sold abroad.

People

Over fifty million people live in the United Kingdom. Four-fifths of them live in towns.

Weather

The weather is changeable. It is not too hot in summer and not too cold in winter. It may rain on any day of the year, but more rain falls in winter than in summer.

THE
LOOKING-GLASS
FOR
THE WORLD TODAY



ACKNOWLEDGEMENTS

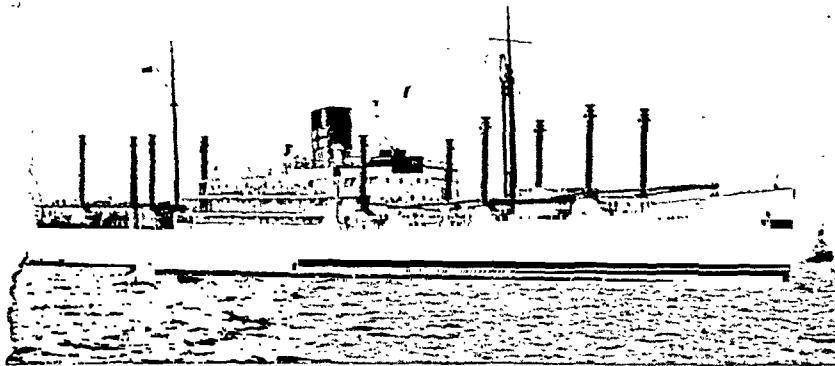
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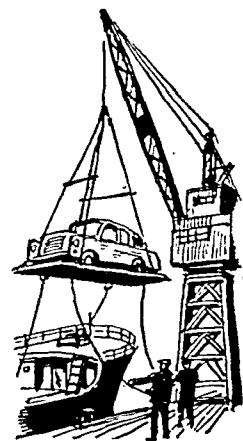
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T.S.M.V. Norfolk



An electric crane

I. A VOYAGE ROUND THE WORLD in a Cargo Ship

Here is the T.S.M.V.* *Norfolk*. She is a general cargo ship of 11,000 tons and she sails regularly between Britain (the "U.K." as sailors say) and Australia

9. Israel	290
10. Water in the Hot, Dry Lands	295
Let's Remember the Hot Lands	299

THE TEMPERATE LANDS

11. The Union of South Africa	301
12. Japan	305
13. A Train Journey across Europe	310
14. The North-East of the U.S.A.	318
15. Russia	324
16. Some Countries of South America	330
17. New Zealand	334
Let's Remember the Temperate Lands	340

THE COLD LANDS AND SEAS

18. The Northern Lands and Seas	343
19. The Antarctic	348
Let's Remember the Cold Lands	351

ACKNOWLEDGEMENTS

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ABOUT PART 4

Part 4 of this book is divided into three sections:

THE HOT LANDS

THE TEMPERATE LANDS

THE COLD LANDS

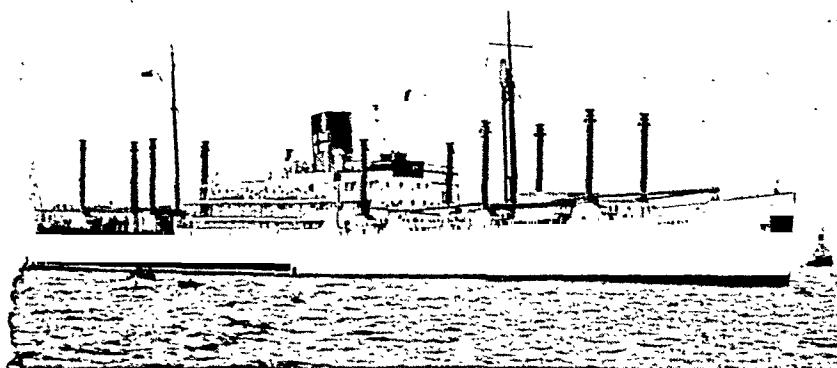
In the first section, you will read about different kinds of HOT LANDS, from the tropical forests of Brazil to the plains of India and the deserts of Australia. In most hot lands the climate makes life difficult.

The second section of part 4 is about TEMPERATE LANDS. In many of them the climate encourages people to work hard, so that in them we find the busiest nations of the world.

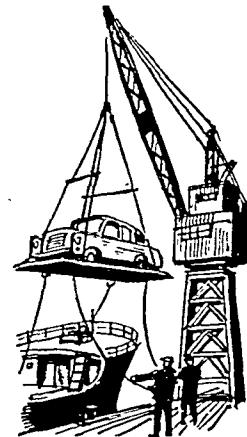
The third section of part 4 describes COLD LANDS. In them, the climate is so harsh that people can provide themselves with food and shelter only by working tremendously hard.

When you are reading part 4 of this book, remember that some countries are so big that they cannot easily be labelled HOT, TEMPERATE or COLD. Huge countries such as Russia, India, Australia and the U.S.A. have many types of climate, peoples and occupations.

Above all, remember that CLIMATE chiefly decides how people live, work and amuse themselves.



T.S.M.V. Norfolk



An electric crane

I. A VOYAGE ROUND THE WORLD in a Cargo Ship

Here is the T.S.M.V.* *Norfolk*. She is a general cargo ship of 11,000 tons and she sails regularly between Britain (the "U.K." as sailors say) and Australia and New Zealand. She is a fine modern ship, built on Clydebank.

Loading the cargo

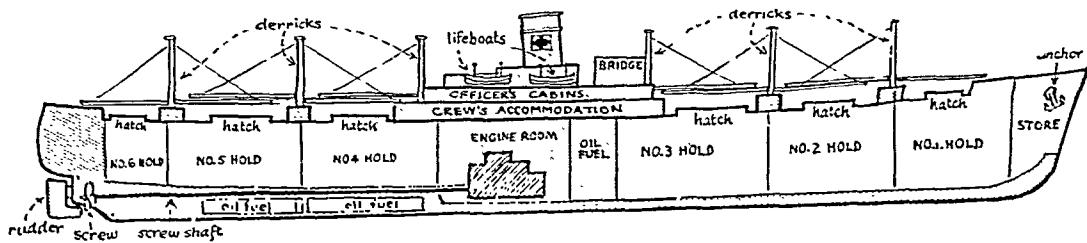
Long before the *Norfolk* begins a voyage, a plan of the ship is filled in to show exactly what cargo is to go into each hold. The holds are filled in such a way that the ship keeps on an even keel, and so that the cargo to be unloaded first is on top. Valuable cargo is stowed with great care, so that it is not damaged, even in a rough sea.

*T.S.M.V. stands for Twin Screw Motor Vessel.

The *Norfolk* loads the first part of her cargo in London docks. Cranes on the dockside swing the cargo into the holds : cars, cotton goods, bags of cement, glass for windows, and earthenware pipes (which will be used for a new hydro-electric plant in Australia).

The *Norfolk* then sails on to Swansea and Newport in South Wales, to load tin plate and galvanised steel, and then to Liverpool to load machinery, cottons and chemicals.

At last, all the cargo has been loaded and the hatches are sealed. The regular crew, who have been on leave, rejoin the ship at Liverpool, and the *Norfolk* sets sail for Australia. Stores and provisions are on board, the tanks of diesel oil for the engines are full, and every important piece of equipment on the ship has been carefully tested.



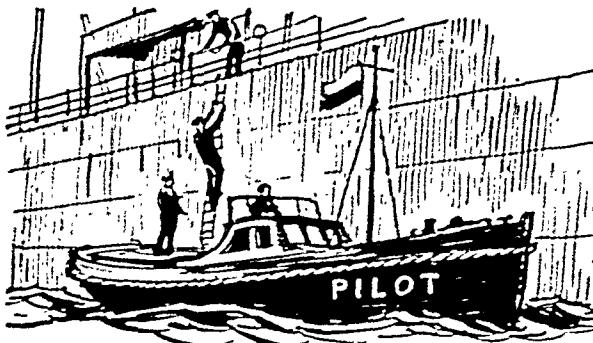
Liverpool to Suez

A Pilot steers the *Norfolk* out of the docks. He leaves the ship off Anglesey, and takes back to Liverpool the letters which the crew have written since the ship left port.

As soon as the ship is at sea, work begins on clearing away all the grime and dirt of loading. The decks and hatches are tidied and washed down, and ropes and gangways are stowed away.

The officers and crew settle down to the normal work of a long voyage. The officers keep watches (which really means "work shifts") on the bridge, in the radio room, or in the engine room. At sea, the Master of the ship is in command: his word is law.

The *Norfolk* sails down the west coast of Britain. On her way she sees lighthouses and lightships, which help to keep her on her course and guide her clear of dangerous rocks and currents. She passes many other ships: coasters, oil tankers, aircraft carriers, iron-ore carriers, and liners heading for

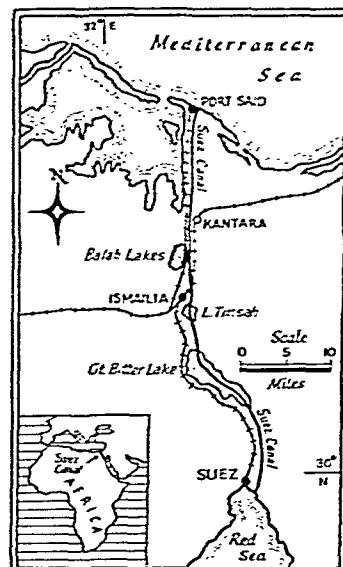


"Dropping" the Pilot into his cutter

Liverpool. Gradually there are fewer ships, until at last the *Norfolk* is out in the open sea and setting course for the Bay of Biscay. She sails through the Strait of Gibraltar, into the Mediterranean Sea, and on to Port Said at the entrance to the Suez Canal. This canal links the Mediterranean Sea with the Red Sea and so shortens the voyage to Australia by 1,200 miles.



The scene on the bridge as the ship leaves port



The Suez Canal



Native "bum boats" crowd round the ships in the harbour at Port Said

Whilst the *Norfolk* is waiting at Port Said she takes on fresh water and vegetables, fuel oil, and letters from home, as she does at every port she visits. Native "bum boats" jostle round the ship, crowded with men selling leather goods and cheap jewellery, and boys dive for pennies thrown into the water by the crew.

The *Norfolk* has to wait until several ships have collected to make a line of ships, called a "convoy". Each ship in a convoy must sail at a fixed speed through the canal, and at a fixed distance from the ship ahead. A south-bound convoy must tie up to the side of the canal to allow a north-bound convoy to pass.

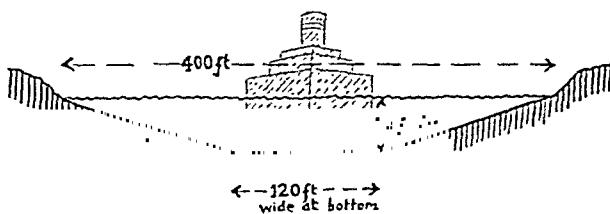
Two Egyptians, with little boats, come on to the *Norfolk* at Port Said. Whenever the ship has to tie up, they row ashore and tie the ship's ropes to bollards at the side of the canal.



Trees have been planted alongside the Suez Canal to prevent sand blowing into it

A Pilot, who works for the Suez Canal Company, has the very responsible job of steering the ship safely through the canal.

On the journey through the canal there is very little to be seen. The countryside is flat, which made it fairly easy to build the canal, as there was no need to make deep cuttings or to build locks. On either side is desert; on the west side there are a few cultivated fields, mud huts and palm trees. But for most of the time on the east side there is only sand, mile after mile of it, with occasional rocks and low scrub.



A section across the Suez Canal

This part of Egypt is very dry (less than 10 inches of rain fall each year), so crops can be grown only in places where water can be brought to the land. The land beside the River Nile can be cultivated, for water from the river can be led to the fields on either side. The water in the Suez Canal cannot be used for irrigation, as it is salt sea-water.

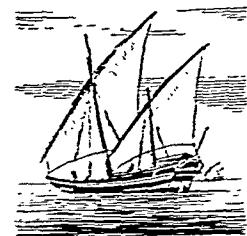
The ship sails on through the Bitter Lakes until she reaches Suez at the entrance to the Red Sea. The whole 100-mile journey through the canal has taken about eleven hours. Every ship using the canal pays a fee to the Egyptian Government. Many of the ships are tankers bringing petroleum from the Middle East to Britain and to other countries in Western Europe.

The Red Sea and the Indian Ocean

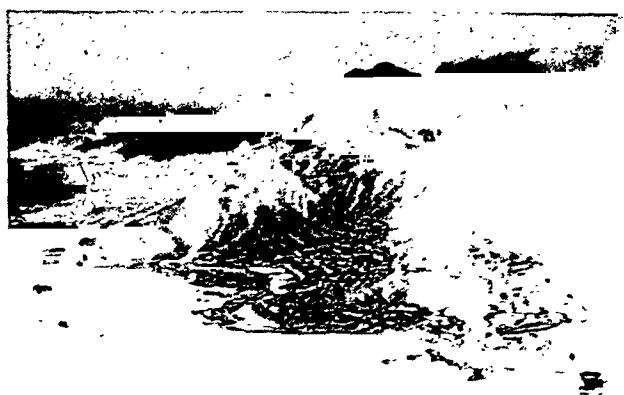
By this time the crew have left off their heavy clothing, for it is very hot in

the daytime and it is hotter still as the *Norfolk* sails through the Red Sea. At midday the steel plates of the ship are so hot that they burn the hands of anyone who touches them.

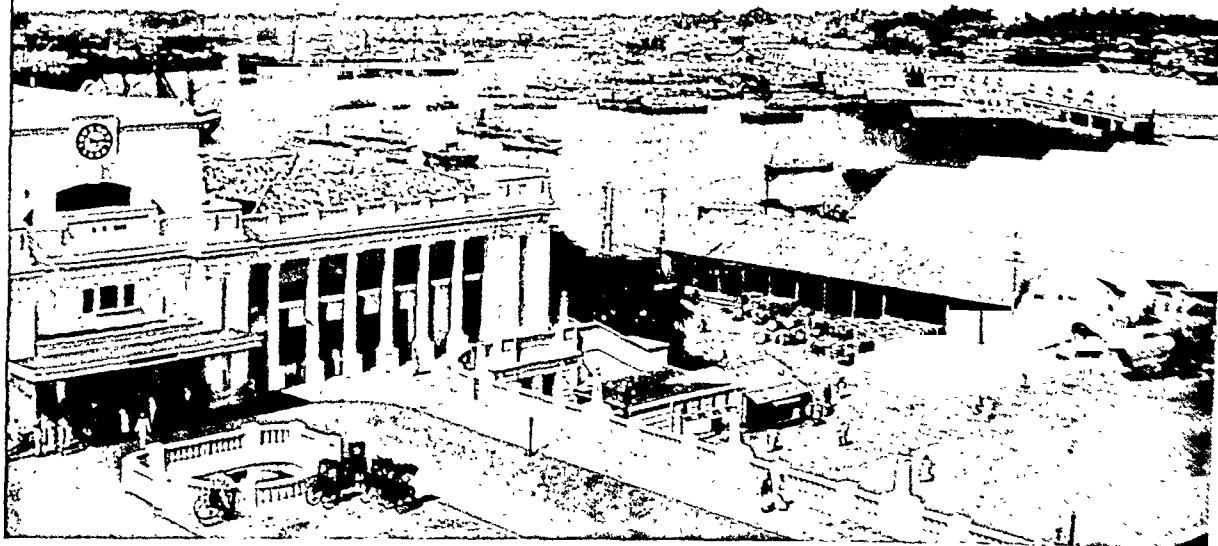
At the southern end of the Red Sea is Aden, a busy port with oil tankers, large passenger liners, local craft, and dhows from Zanzibar and the west coast of Africa. Many ships take on oil here, for it is cheaper than almost anywhere else in the world, since Aden is very close to the oilfields. There are no large jetties, so all ships tie up to buoys, and goods and passengers are taken ashore in small boats.



An Arab dhow from Zanzibar. The triangular sails are called "lateen" sails



An aerial view of Aden, at the southern end of the Red Sea, where many ships take on oil. The town is at the end of a rocky peninsula, and is surrounded by mountains. The climate is very hot

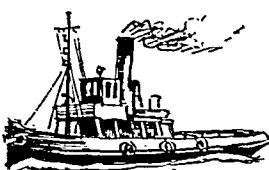


The harbour at Colombo, the capital and chief port of Ceylon

From Aden the *Norfolk* sails across the Indian Ocean. The breezes make the air much cooler than it was during the hot trip through the Red Sea. When the ship reaches Colombo in Ceylon the crew notice how fresh and green everything is, after the dry brown lands of Suez and the Red Sea.

Whenever the *Norfolk*, or any large ship, berths at a port such as Colombo, where there are no wharves, tugs are needed to help the ship into position at the dockside.

The *Norfolk* stays at Colombo for twelve hours, during which time she takes on board all the usual supplies. Other ships in the harbour are loading tea, rubber, copra and coconuts.



A tug. The stern is free of any obstructions which might foul the tow rope

“Crossing the line”

“Crossing the line”

Soon after leaving Ceylon there is the ceremony of “crossing the line”, when anyone who is crossing the equator for the first time is made a “citizen of King Neptune”. If the ship has no swimming pool, a canvas tank is set up and filled with sea water. Then the new citizens are lathered, shaved, christened with such names as “Harassed Herring” or “Soulful Salmon” and tipped into the water.



Discharging cargo in Australia

The *Norfolk* sails on across the Indian Ocean to her next port of call: Fremantle in Australia. As soon as the ship is tied up, there is a surge of activity: gangways are brought up, cranes swing over the holds, and customs men and port officials hurry aboard. Australian dock workers, using both dockside cranes and the ship's winches, unload part of the cargo—motor cars and agricultural machinery—and put it into sheds on the wharf.

When the cargo for Fremantle has been unloaded, the *Norfolk* sails past the big grain elevators where tramp ships are loading grain to take to Britain, and past a large oil refinery, out to sea. Four days later she reaches Melbourne, where more of the cargo is discharged, and then she sails on to Sydney, the biggest and busiest port in Australia. She sails under the famous Sydney Bridge and into the great landlocked harbour where ships are loading wool, skins, hides, tallow, eggs, canned fruit and canned meats.

At last the whole of the cargo which the *Norfolk* brought from the U.K. has been discharged. Then each hold is thoroughly washed and cleaned and the ship is ready to take on board refrigerated cargo in New Zealand.

Loading in New Zealand

In New Zealand, as in Australia, the crew feels really at home. They have met many strange people at ports on the way, but New Zealand is a country of people from Europe, many of them from Britain. (Some of the New Zealand policeman even wear the same helmets as the British "bobbies".)

At Auckland, two holds are filled with mutton, lamb, cheese and butter, frozen to a temperature of 6° F.

Then the ship sails on to Napier. Here boxes of apples are taken on. They must be kept cool but not frozen. Great care is taken in loading and packing the cargo to make sure that things with a strong smell, such as cheese or wool, are not packed with apples or butter.



Melbourne docks. The Victoria Dock, once a swamp, is separated from the city only by the railway yards of the interstate railway terminus

Home again

The *Norfolk* sails on across the Atlantic Ocean. When she is off Cornwall she sees the flashing light of Eddystone Lighthouse—a double flash every half minute. Each lighthouse flashes a different signal from those near to it, so that it can easily be recognised.

Off Brixham in Devon, or off Beachy Head, a Channel Pilot comes aboard. He takes the ship as far as Gravesend.

At Wellington, the capital of New Zealand, other kinds of food are loaded—crates of eggs, drums of honey, mutton wrapped in mutton cloth, and beef wrapped in sacking.

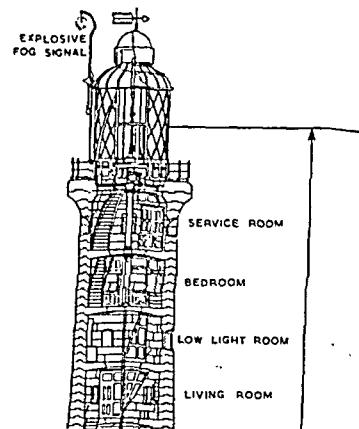
Wellington has a beautiful harbour, and the town has fine modern buildings, including the New Zealand Houses of Parliament.

At Lyttelton, the port for Christchurch, more meat is taken on board. The *Norfolk* is now fully loaded and she sets course on her way home across the Pacific Ocean.

The voyage home

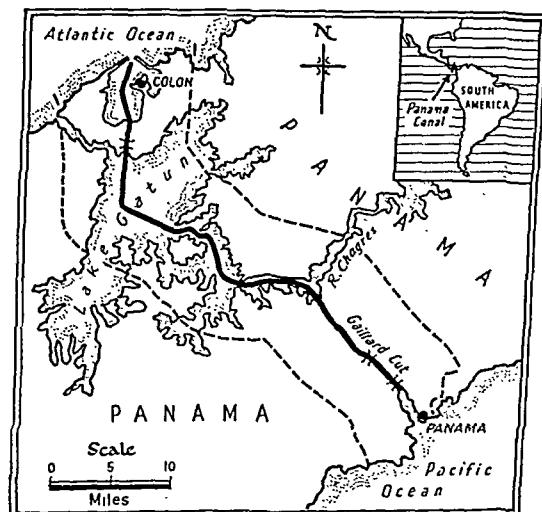
The *Norfolk* sometimes calls at Pitcairn Island, midway between New Zealand and America. Many of the inhabitants are descendants of the crew of the ship *Bounty*, who took part in a famous mutiny in 1789. They paddle out in canoes and swarm all over the *Norfolk*, selling beads, bananas, oranges, and other fruit.

While the ship is at anchor, the crew "post" letters home. The letters are taken back to the U.K. in the *Norfolk*—but they bear the Pitcairn Island stamp.



When the *Norfolk* reaches Balboa she begins her journey through the Panama Canal, which links the Pacific Ocean with the Atlantic Ocean.

The Canal is 36 miles long; half of this is through an artificial lake, Lake Gatun, which was made by damming the river Chagres. Twelve locks, in three flights, carry ships up to and down from Lake Gatun, which is 85 feet above sea level, and small electric engines pull the ships through the locks.



The Panama Canal

Discharging cargo in Australia

The *Norfolk* sails on across the Indian Ocean to her next port of call: Fremantle in Australia. As soon as the ship is tied up, there is a surge of activity: gangways are brought up, cranes swing over the holds, and customs men and port officials hurry aboard. Australian dock workers, using both dockside cranes and the ship's winches, unload part of the cargo—motor cars and agricultural machinery—and put it into sheds on the wharf.

The Atlantic port is Colon. Here the *Norfolk* bunkers for fuel and fresh water. (She does not take these on before going through the canal or she would be charged higher canal dues

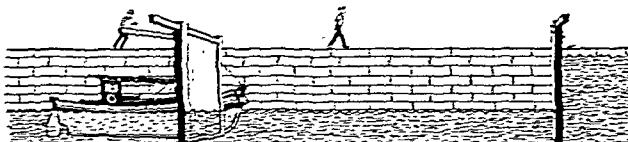
At last the whole of the cargo which the *Norfolk* brought from the U.K. has been discharged. Then each hold is thoroughly washed and cleaned and the ship is ready to take on board refrigerated cargo in New Zealand.

Loading in New Zealand

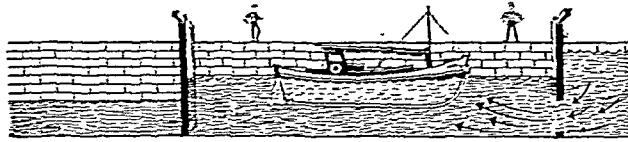
In New Zealand, as in Australia, the crew feels really at home. They have met many strange people at ports on the way, but New Zealand is a country



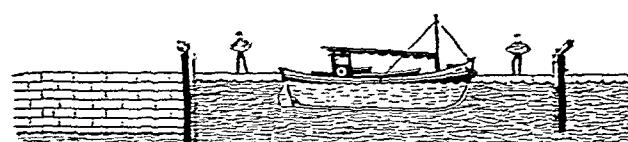
The Gaillard Cut on the Panama Canal



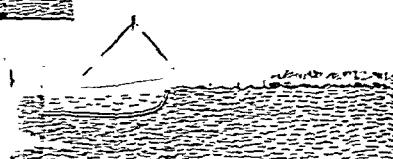
1. The lower lock gate is opened and the boat sails into the lock. The level of the water in the lock is the same as that in the canal below the lock



2. When the lower gate has been shut, the sluices in the upper gate are opened. Water passes into the lock and so raises the boat



3. When the level of water in the lock is the same as the level up-stream, no more water can flow



4. The upper lock gate is opened and the boat continues its journey

How a lock is used to raise a boat

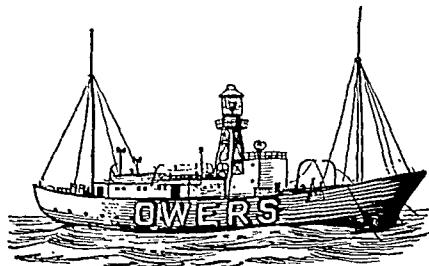
Home again

The *Norfolk* sails on across the Atlantic Ocean. When she is off Cornwall she sees the flashing light of Eddystone Lighthouse—a double flash every half minute. Each lighthouse flashes a different signal from those near to it, so that it can easily be recognised.

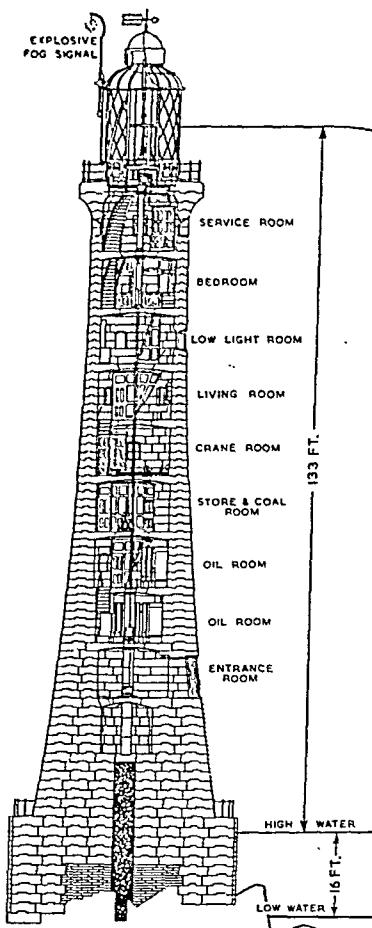
Off Brixham in Devon, or off Beachy Head, a Channel Pilot comes aboard. He takes the ship as far as Gravesend where a River Thames Pilot takes over to steer the ship to the Royal Albert Docks. A Dock Pilot steers the ship, with the help of tugs, into the dock, where work begins at once to unload the refrigerated cargo. Most of the crew are "paid off" immediately, and they go on leave. As soon as the cargo is unloaded, the ship is cleaned and immediately the dockers begin to load the next cargo.

The log of the *Norfolk's* voyage

The voyage has taken 16 weeks, including time in port as well as at sea. Here is a log of the *Norfolk's* sailing time, not including time spent in the ports.



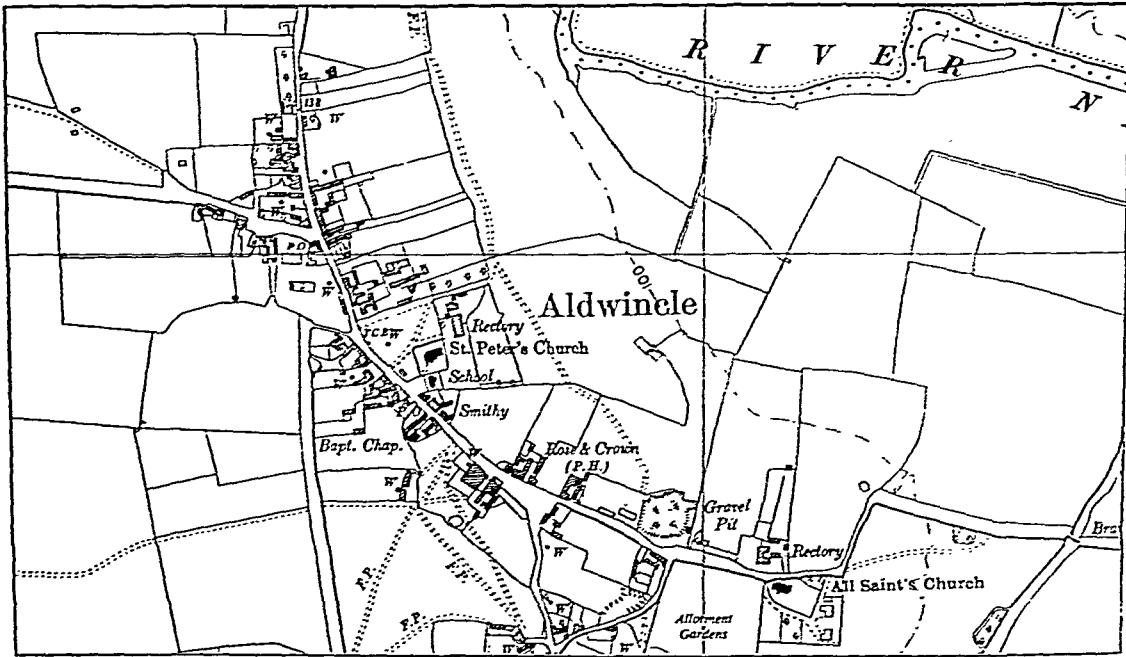
The *Owers* lightship, which is anchored off Selsey Bill, Sussex. Lighthouses and lightships are used as aids to navigation. Sometimes they mark places which are dangerous to shipping. At night they show a flashing light



Eddystone lighthouse

		Sailing time
Liverpool to Port Said	.	8 days
Suez Canal	.	2 days
Port Said to Aden	.	$3\frac{1}{2}$ days
Aden to Colombo	.	$5\frac{1}{2}$ days
Colombo to Fremantle	.	8 days
Fremantle to Melbourne	.	4 days
Melbourne to Sydney	.	$1\frac{1}{2}$ days
Sydney to Auckland	.	$3\frac{1}{2}$ days
Auckland to Wellington	.	$1\frac{1}{2}$ days
Wellington to Lyttelton	.	$\frac{1}{2}$ day
Lyttelton to Balboa	.	$17\frac{1}{2}$ days
Panama Canal	.	2 days
Colon to Curaçao	.	2 days
Curaçao to London	.	11 days

Sailing time, $70\frac{1}{2}$ days



A map of Aldwinclie, Northamptonshire. (Scale : 6 in.=1 mile)

2. LOOKING AT MAPS

What large-scale maps show

A map with a scale of 25 in.=1 mile is called a large-scale map. On such a map the shape of every building is shown, the houses are numbered, and even telephone kiosks are marked and named. Part of a "25-inch" map is shown below.

A map with a smaller scale (say 6 in.=1 mile) shows a larger area, and so cannot show the shape of every building.



Part of a map with a scale : 25 in. = mile

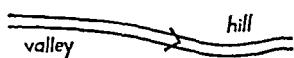
Rows of houses are shown, but not each separate house. On the "Six-inch" map above, initial letters have been used to mark such things as wells (w), a footpath (FP) and a Post Office (PO).

What a small-scale map shows

A map with a still smaller scale (such as the One-Inch Ordnance Survey map ; scale 1 in.=1 mile) shows roads, rivers and woods clearly. (Rivers are coloured blue, main roads are red, and woods are green.) But the shape of many things such as Post Offices, railways and churches cannot be shown. Instead of showing the actual shapes of these things on the map, little signs, called *conventional signs*, are used. A One-Inch Ordnance Survey map is printed opposite page 256. Underneath the map is a key to some of the conventional signs used on it.

How to show high land and low land on a map

If you make a sketch map of your journey to school, you may want to show a place where you walk up a hill, or down a hill. You can do this by putting an arrow on a road, to show an uphill gradient, like this :



Or you can shade the high ground, like this :



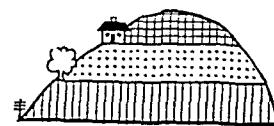
But these methods are not very helpful, for they do not show clearly just where the ground is highest, or how steeply it rises.



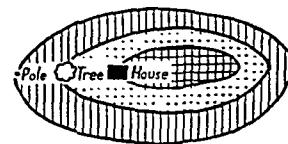
Here is a hill. Near the top is a cottage, and halfway up is a tree. At the foot is a telegraph pole. Let's see how we can draw this hill to show which parts of the hill are highest and which are lowest. First shade the picture of the hill to show all the land which is higher than the cottage : 

Then shade all the land higher than the tree but lower than the cottage : 

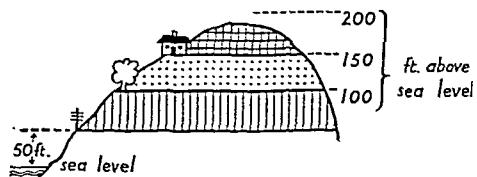
Lastly, shade the land between the telegraph pole and the tree : 



If we draw this hill, to show it as seen from above, and then shade the drawing, it looks like this :



Lines have been drawn to separate the different heights on the hill. All the land on one side of these lines is higher than all the land on the other. The lines are called *contour* lines. They are used on maps to show how high the land is above sea level.



Suppose that we measure the distance between the telegraph pole and sea level, and find that it is 50 ft. If the base of the tree is 50 ft. higher up the hill than the foot of the telegraph pole, and the cottage 50 ft. higher than the tree, then the contour lines drawn through these things are each 50 ft. apart. We say that the *contour interval* is 50 ft. On the One-Inch Ordnance Survey map, facing page 256, the contour interval is 50 ft. (The contour lines are brown.)



Where on the map is this signpost?
Notice the church in the distance



The church with a spire, Aldwincle.
On the right is the village school



The church with a tower,
Aldwincle

Using the conventional signs

This is how one boy finds the conventional signs useful. He is going by train to the main station at Thrapston. Then he has to find his way to Aldwincle Post Office, two miles to the north. On the train he looks at his One-Inch Ordnance Survey map and works out his route.

“When I come out of the station I shall turn left down the High Street (A604), and then left again where the church with a spire stands behind the buildings on the corner.

“Leaving the town by this road (A605), I shall soon see, on the left, a reservoir and a river. Then I shall see a railway which goes along an embankment and into a cutting. Beyond the cutting is a copse. I shall walk under a line of pylons which crosses the road, and almost half a mile farther on, just over the top of a small hill, I shall turn left, down a track leading over the railway. The track crosses a river, then a stream, and then some meadows.

“Away to the right I shall see a square-towered church on the edge of

Aldwincle. I shall cross a lane and take a footpath leading to the Inn. When I meet the road I shall turn half left, and go past the church with a spire. The Post Office is beyond it, on the right.

“The distance on the map from the station to the Post Office is about three inches, so I shall have to walk about three miles.”

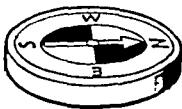
When you have followed this walk on the One-Inch map opposite, follow the last part of it on the Six-Inch map on page 254.



Aldwincle Post Office

The compass

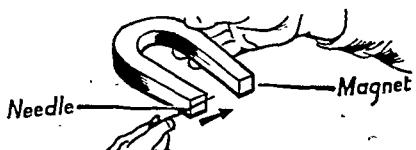
How can you find out where north lies? At midday you can find north by standing with your back to the sun. Then you are facing north. At night, look for the bright North Star, with the Plough pointing to it. You can also find north by looking for the mossy side of trees. But the best way of finding north is to use a compass.



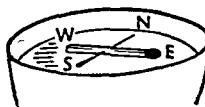
A pocket compass. The needle swings until it points to the north

The swinging needle of the compass always points to magnetic north, which is very near to true north. If you *orient* your compass (put the north of the compass card under the north-pointing needle) then you can "read" your map properly.

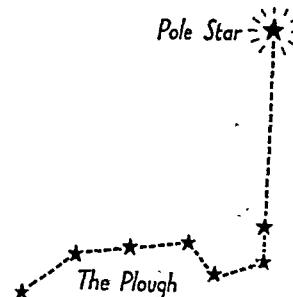
A small pocket compass does not cost much, but you can make a simple compass by rubbing an ordinary needle with a magnet, pushing the needle through a match stick, and floating it in a bowl of water. The needle will turn and point to the north.



Making a compass by stroking a needle with a magnet



When the needle is floating, it turns and points to the north



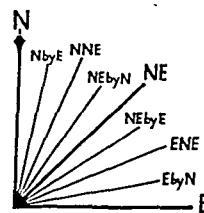
The stars at the end of the constellation called the "Plough" (or "Great Bear") point towards the Pole Star. This star is always due north. (Remember that the Plough appears to revolve round the Pole Star, so it will not always look as it does here.)

Every good map has on it an arrow-head something like this :



When you use the map, you must first point the arrow-head towards the north. Then you can "read" the map correctly, looking to your right for places in the east, to your left for places in the west, and so on.

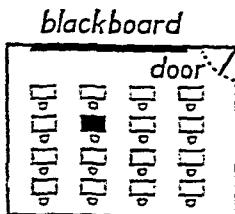
Sailors "box" the compass by saying the names of the 32 main directions in which a compass points. Here are the first five points : north, north by east, north-north-east, north-east by north, north-east. Can you work out the rest?



Nine of the thirty-two "points" of the compass

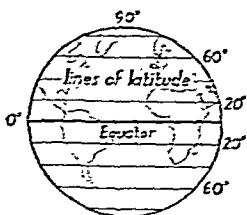
How to describe a position on a globe or map

If you want to point out the position of a desk in a classroom you can do so by referring to the door and the blackboard: "The second desk from the blackboard in the third row from the door."



Lines of latitude

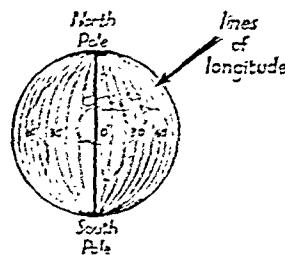
In a similar way we can describe positions on a globe. Our first "starting line" is the equator, which goes round the earth. Other lines are imagined to the north and south of the equator. These lines are called lines of *latitude*. They are always the same distance apart. The lines are numbered in "degrees" from 0° (nought degrees) at the equator to 90° at the north and south poles. Thus part of Cornwall is 50° north (50° N.) of the equator. The tip of South Africa is 35° south (35° S.) of the equator.



Lines of longitude

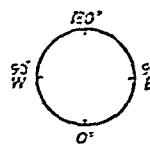
Our second "starting line" is a line drawn from the north pole to the south pole, through London. Other north-south lines, called lines of *longitude*,

are on either side of it. They are widest apart at the equator, but become closer together to the north and south of the equator, until they all meet at the two poles.



The line of longitude through London is 0° . The other lines of longitude are numbered from 0° to 180° , going eastwards and westwards. On the opposite side of the earth from London is the line of longitude of 180° . The islands of Fiji are on this line.

Halfway between longitude 0° and 180° are the lines of longitude of 90° E. and 90° W. The city of New Orleans, in the U.S.A., is on the line of 90° W. The line of 90° E. passes through the delta of the River Ganges.



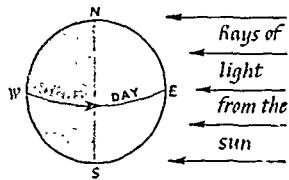
A "slice" through the earth. Halfway between longitude 0° and 180° are 90° E. and 90° W.

By using these lines of latitude and longitude we can refer to the position of places on a globe (or on a map, which is really part of a globe).

Here are the descriptions of two places. Look for them in an atlas: New Orleans (U.S.A.): 30° N., 90° W.

The mouth of the River Amazon (South America): 0° N., 50° W.

On most of the maps in this book there are lines showing latitude and longitude.



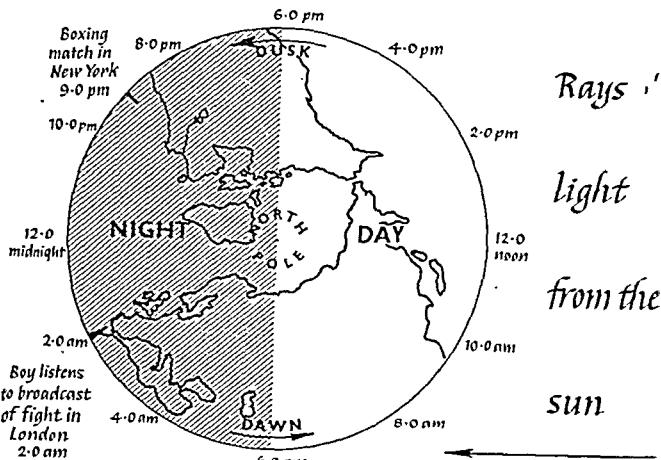
The earth is turning in a west-to-east direction

Time

Have you ever listened to a commentary on a Cricket Test Match from Australia? If so, you know that when the cricketers are just finishing the day's play, you are having your breakfast. When it is 6.0 p.m. in Sydney, it is 8.0 a.m. in Britain. Similarly a broadcast of a boxing match at 9.0 p.m. in New York is heard at 2.0 a.m. in London.

Why is this? The earth is turning in a west-to-east direction. This means that daylight comes earlier to places in the east. Dawn in India comes before dawn in Africa, but each has its dawn at the same time by the clock.

To achieve this, the world is divided into 24 zones, each of which has its own time. Standard time, which is used as a basis for working out time all over the world, is decided in Britain. It is called Greenwich Mean Time (G.M.T.). Places east of Greenwich are ahead in time (eAST=fAST). Places west of



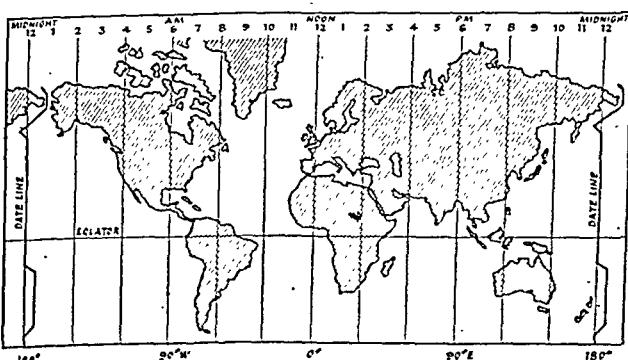
Greenwich are slow in time (West=slow).

There are 24 time zones, as you can see from the map. If you travel east, you must put your watch on an hour every time you cross a zone line, otherwise the sun would seem to rise earlier every day. If you travel west, you must put your watch back an hour every time you cross a zone line.

The International Date Line

What happens if one plane travels east from London, putting its clock on an hour at each zone line, and one travels west, putting its clock back? When they meet at 180°, one pilot says the time is nearly midnight on Friday, the other says it is nearly midnight on Thursday.

To sort this out, there is an International Date Line, an imaginary line drawn from north to south through the Pacific Ocean. Travellers going eastwards across the line subtract 24 hours. Thus the first plane would have two Fridays. Travellers going westwards add 24 hours. The second plane would have no Friday. An easy way to remember this is to say "going west, a day 'goes west'."



The world is divided into 24 Time Zones

SECTION ONE: THE HOT LANDS

3. BRAZIL

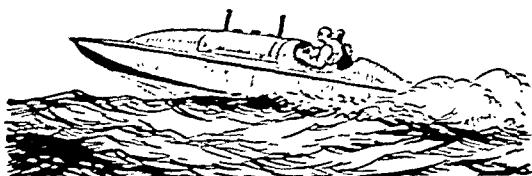
Brazil is a huge country, the fourth largest in the world. But although it is twenty-seven times larger than the British Isles, its population is almost the same. Much of Brazil is covered by dense tropical jungle, often called the Amazon forest, because the great River Amazon flows through it. (See the map on page 330.)

The River Amazon

The Amazon flows nearly 4,000 miles across South America, from the Andes of Peru in the west, to the Atlantic Ocean in the east. The hundreds of tributaries which flow into the main river, and the land between them, make up the *basin* of the Amazon. Although most of this basin belongs to Brazil, other countries own smaller parts of it.



All kinds of craft travel along the waters of the Amazon and its tributaries. Canoes hollowed out of tree-trunks are used by most of the river dwellers, but doctors, and other people who need to travel quickly, usually go by hydroplane.



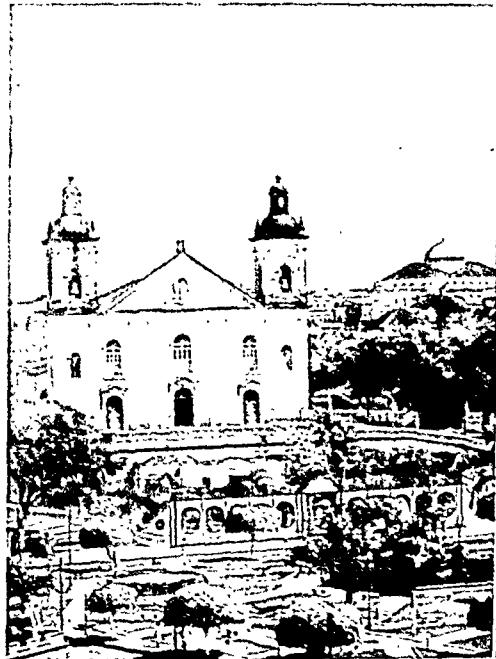
A hydroplane

Steamers can go a long way up the Amazon, and ocean liners can travel 1,000 miles up the river, as far as Manaos. At Iquitos in Peru, 1,000 miles further on, the Amazon is still more than a mile wide, and deep enough for cargo boats to dock.

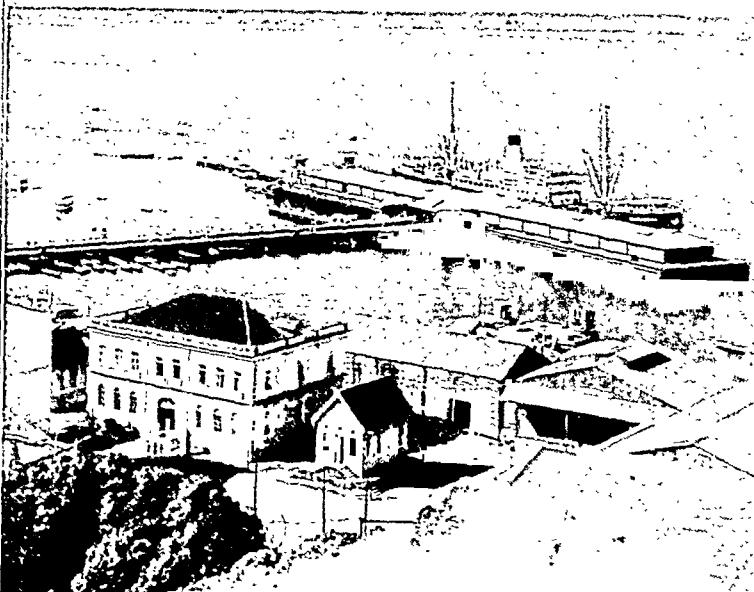
The Amazon forest

The forests steam with moist heat, and swarms of mosquitoes and other insects make life very difficult for Europeans. At one time, few people explored the Amazon basin, but today, oil and minerals have been discovered, and oil drillers and engineers are working there.

Prospecting for oil is a difficult job in the jungle of Brazil



The city of Manaos, 1,000 miles up the River Amazon. Fifty years ago, when the world's rubber came from the Amazon forest, Manaos was a "boom city"



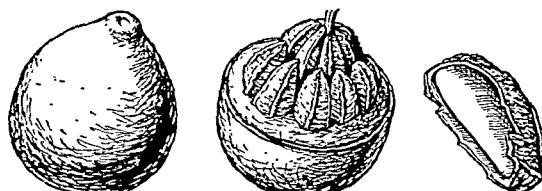
The port at Manaos, which can be reached by ocean-going vessels. Floating quays are needed, as the river level changes by as much as 30 ft., through variations in rainfall over the basin of the river

The hot, wet forests contain many valuable hardwoods, including mahogany and rosewood, both used for making furniture.

Traders go into the forest to collect castor beans, brazil nuts and rubber. The tree which produces rubber originally grew only in the Amazon forest, but nowadays there are rubber plantations in Indonesia, Ceylon and Malaya. The countries of the Amazon basin, instead of exporting rubber, now produce only enough for their own needs.

The campos and the high lands

To the south of the tropical forests are the *campos*, grasslands similar to the savannah in Africa. Here, very little rain falls, and then only at the hottest time of the year, so that only coarse



Brazil nuts are enclosed in a hard outer covering

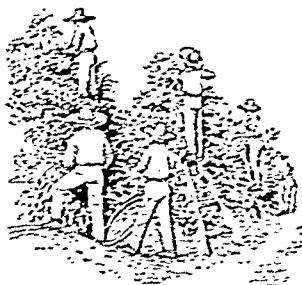
grass, thorny bushes and trees can survive. On the better land, the few people who live there rear cattle for meat.

Most of the people of Brazil live on the coastal plain which lies between the Brazilian Highlands and the sea. On this plain, all the crops of tropical countries can be grown: sugar cane, cocoa, cotton, tobacco and rice, as well as fruits such as oranges, limes, bananas and pineapples.



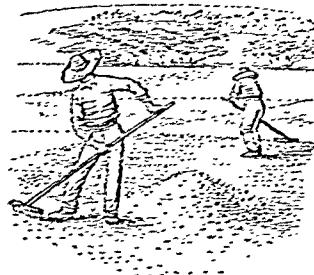
A coffee plant showing the fruit, the beans, and the white, starry flowers

Picking the ripe coffee "cherries". A good picker can gather as much as 200 lb. of fruit in a day



Winnowing coffee to remove the dust and leaves from the fruit

The coffee beans are spread out in the sun to dry



Coffee

In the south-east of Brazil, the land rises sharply from the coastal plain. More than half the world's coffee is grown on the hillsides, much of it on large plantations (called *fazendas*) west of Rio de Janeiro and round São Paulo. The hillsides there have a rich, red soil.

There is plenty of sunshine, and plenty of rain which drains away down the slopes.

The seedlings are planted out during the summer months, from November to February, in the wettest part of the year. They grow in the shelter of other trees until they are large enough to be planted out again.

From its fifth year onwards the coffee plant produces small fruits which look like crimson cherries. Inside, each fruit has two greyish-green beans which are surrounded by a soft pulp. After the pulp has been loosened by squeezing the fruit in machines, the beans are washed in cement troughs, and spread on concrete drying grounds to dry in the sun. (On some *fazendas*, the drying is done indoors by artificial heat.)

When the beans have been sorted, they are put into jute bags and sent to São Paulo. From São Paulo, the "coffee railway" takes them down the steep slope of the Brazilian Highlands to the port of Santos. Most of Brazil's coffee crop goes to the U.S.A.

Today, the old India is changing, and throughout the country the people are becoming better farmers. "Village helpers" are sent by the government to show the people how to use artificial fertilisers, and how to sow new varieties of seeds, so that they can grow more food on the same land.

Here are some ways in which the villages are being improved :

Making drains and paving the streets.

Filling in mosquito breeding holes.

Repairing and building new wells to make a "safe" water supply. (Typhoid germs, which cause a dangerous fever, can be taken into the body in water which is not pure.)

Building schools and health centres.

If the people of the villages are to have better food, animals as well as land must be made to produce more food. In Great Britain, where there is enough

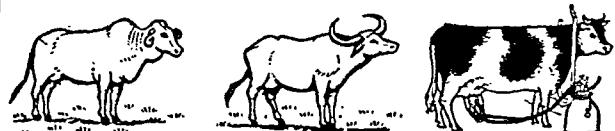


The "village helper" tries to persuade the villagers to use better seed on their land

rain to provide plenty of good grass, the cows give eighteen times more milk than Indian zebu cows. (A zebu is an ox-like animal with a large hump.) India has far more zebus than the land can feed, but because cows are sacred, the people do not kill them.



Many houses are built of sun-dried mud bricks. Notice the string bed, the sacred cow, and the new pump



40 Zebu cow
gals. a year

Buffalo
100 gals. a year

British cow
720 gals. a year

Nowadays, some farmers are crossing their zebus with Jersey cattle, so that they will give a greater quantity of milk. Every year more milk is needed to feed the increasing number of people in the cities.

The country of the Ganges delta

Towards the sea, the Ganges divides into many mouths. The mud carried in the water of the river sinks to the bottom, and in time a flat piece of land is built up. (Land such as this, which forms between the mouths of a river, is called a *delta*.) Pakistan and India share the delta of the Ganges.

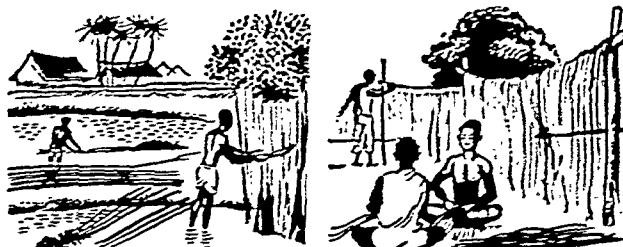
As there is a heavy rainfall round the Ganges delta, and plenty of water, the vegetation is always green, even in the hot season. Formerly much of the delta was covered with marshy jungle inhabited by tigers and crocodiles. Nowadays, parts of the delta are used for growing rice. The country is a maze of waterways : the houses are on earth mounds, and the few roads and railways are built on high embankments.

Jute growing

Nearly all the world's jute is grown in the hot, swampy delta country of

Pakistan and India. Jute is sown in February or March and harvested at the end of June, when the plant has grown to about fifteen feet high. The stalks are cut, bound in bundles, and left under water in streams and ponds.

As soon as the woody, outside stem begins to soften, the long tresses of fibre inside are stripped off and cleaned by beating them on the water. The people stand waist deep as they work. Then the long hanks are hung on racks to dry.



Cutting and soaking jute

Stripping the fibre and hanging it in the sun to dry



Jute manufacture

Indian jute is rolled into bales and taken to Calcutta, sometimes by bullock carts, but more often in flat-bottomed boats called "jute flats". The jute mills lie on both banks of the River Hooghly, and stretch for many miles up-stream from Calcutta. In the mills, the raw jute is spun into yarn ; most of the yarn is woven into different kinds of sacking.

New houses built at Chandigarh in the Punjab. The raised bricks on the walls throw shadows, and so help to keep the houses cool



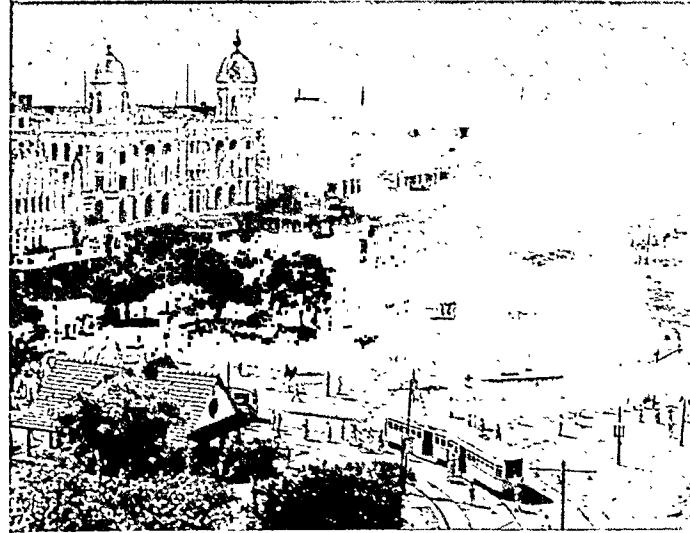
A potter making earthen cups on a wheel

The jute grown in Pakistan goes to mills near the delta town of Dacca, or to the port of Chittagong. East Pakistan sells raw jute to India, which cannot grow enough good quality jute for her own factories. Some jute goes to Dundee in Scotland.

As well as being used for sacking, jute fibre is made into garden twine, window sash cords, brown wrapping paper, backing for linoleum and chair webbing.

Calcutta

Calcutta, the capital of the province of West Bengal, is a busy manufacturing city on the River Hooghly, 80 miles from the sea. Calcutta's chief exports are tea, grown on the hillsides of Assam



The main street and tram station, Calcutta

near Darjeeling, coal, and articles made from jute.

Calcutta, like many other cities in India, Pakistan and other parts of the world, is very overcrowded. There are many poor people who have no homes, and who have to sleep on the pavements.

To make the city less crowded, a new town is being built with its own industries. It is difficult to use the land around Calcutta because of the marshy country, but there are plans for pumping out the water from two salt lake swamps on the east of the city. Once the swamps have been drained, the land will be used partly for building and partly to grow rice.



Planting out rice seedlings in fields which have been flooded. Rice is the main food of the people of India, China, Japan, and many other countries in Asia

The changing countryside : industry

The population of India is growing so quickly that agriculture cannot provide enough work for everyone. Other work, besides farming, must be found, and so more and more factories are being built.

Nearly every industry needs steel, and in countries with growing industries a great deal is needed. To the west of Calcutta, in the provinces of Bihar and West Bengal, there are large quantities of good quality iron-ore as well as plenty of coal to make it into steel. This part of the country is an important industrial area, with factories making artificial fertilisers, brass and aluminium goods, and cement for the new towns and blocks of flats.

India already has steel works in Bihar and West Bengal, and she is using her steel as fast as she can make it. Three new plants are being built: by Russia, Germany and Great Britain. The steel works built by Britain is in West Bengal, on barren wasteland where the people have a hard struggle to grow crops.



Whenever a new factory is built, much of the cement and other materials needed are carried by women, in dishes balanced on their heads



Building a new steel works, in West Bengal

The blast furnaces were made on Tees-side, and then shipped in sections to Calcutta.

Every new steelworks and every new factory built in India means regular work and better wages for the people in the nearby villages.

India in the future

India is still largely a country of peasant farmers, but gradually, and slowly, more people are becoming factory workers and traders. India needs more factories, and more goods to sell abroad, so that she can earn more money. Then she will be able to build the new schools, hospitals, houses, roads and railways which are so badly needed.

A poster designed to attract Britons to settle in Australia

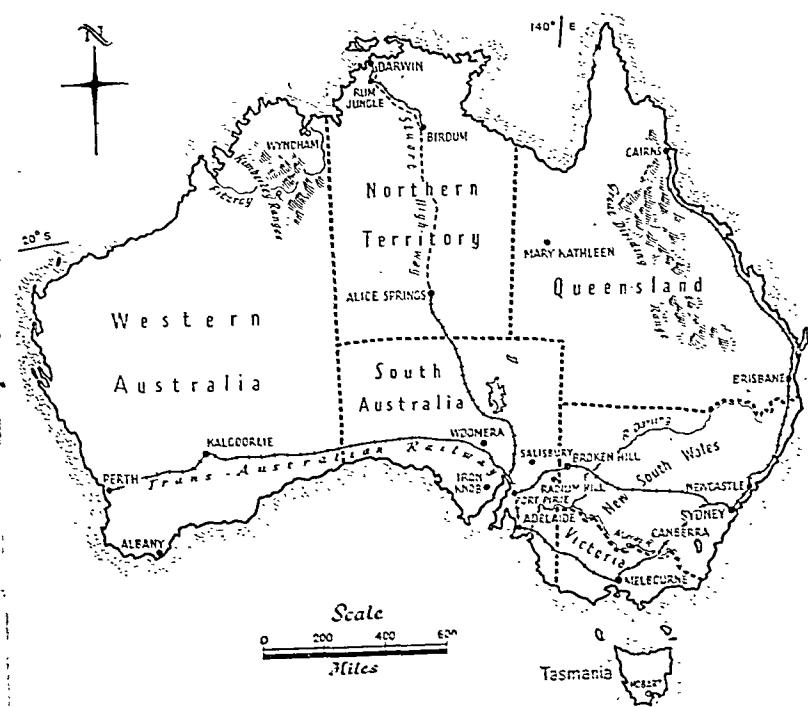
5. AUSTRALIA

Advice to immigrants

"As a passenger, you will have to provide your own bedding, and also whatever candles you burn in your own cabin. If you are a man given to reading, I would advise you to buy a large transparent lantern, six pounds of wax candles and some amusing books."

This was the advice given to some of the first British immigrants to Australia, over 100 years ago, when they were preparing for the long sea voyage.

How different it is for emigrants to Australia today. The journey by sea from Britain to Adelaide takes 26 days instead of four months. The special fare for immigrants is £10 for each person, and children travel free.



You can go to Australia as a family under the assisted passages scheme
ADULTS PAY £10 - CHILDREN FREE

Size and population

Australia is 32 times the size of Great Britain, and yet in Greater London there are more people than in the whole of Australia. That is why millions of immigrants are needed to develop the country.

Much of central Australia is desert. The main settlements are in the southwest (from Perth to Albany), the south-east (Victoria), and along the eastern coastal plain of New South Wales and Queensland. As the south-east trade winds bring rain, this narrow coastal plain, which lies between the mountains of the Great Dividing Range and the sea, is one of the most important parts of Australia. Dairy cattle are pastured on the New South Wales plain, and sugar-cane, tobacco and tropical fruits are grown in the hotter climate of Queensland.

On the plains of New South Wales and Queensland many sheep are grazed. Other sheep raising areas are Victoria, South Australia, and the south west of Western Australia. Some sheep such as merinos, with their soft, crinkly wool, are reared for their fleeces. Other breeds are reared for their good quality meat.

The government does not want all the immigrants to go to the eastern states, or to the cities. Already more than half the people in Australia live in the state capitals such as Sydney, Melbourne and Adelaide. The new immigrants are needed in the smaller towns, and in the "outback", the vast, lonely stretches of country away from the towns.

Aeroplanes in the outback

The roads over much of the north are merely rough tracks, passable only during the dry season. There is one railway line from Perth to Adelaide, west to east across the Nullarbor Desert, but at the moment there is no through line from north to south.

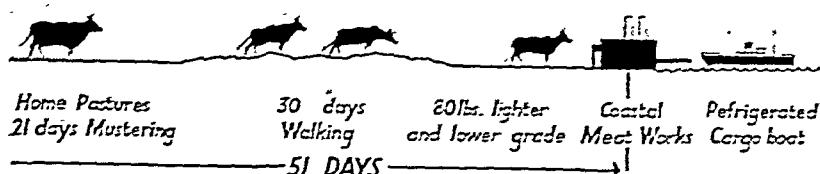
In the outback, as a result of this shortage of road and rail links, aeroplanes are used a great deal. Many farmers and doctors use their own light



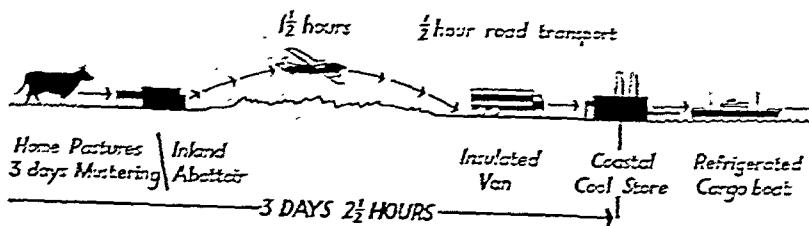
A merino ram

planes. Flying is easy in a country with such wide open spaces and such good weather, and very useful for men whose nearest neighbour may be thirty miles away.

In the Kimberley Ranges of Western Australia, aeroplanes are used for the "beef airlift". The Kimberleys are part of the large grassland area which stretches right across the north of Australia through the Northern Territory and into Queensland. Every year, men called "drovers" herd thousands of beef cattle from these inland areas to abattoirs on the coast, hundreds of miles away. Cattle which are walked for such long distances lose a great deal of weight by the time they reach the slaughter houses.



It takes about 51 days to drive cattle from the inland areas to the abattoirs on the coast



Cattle moved by the "beef airlift" take only 3 days from the pastures to the cool store

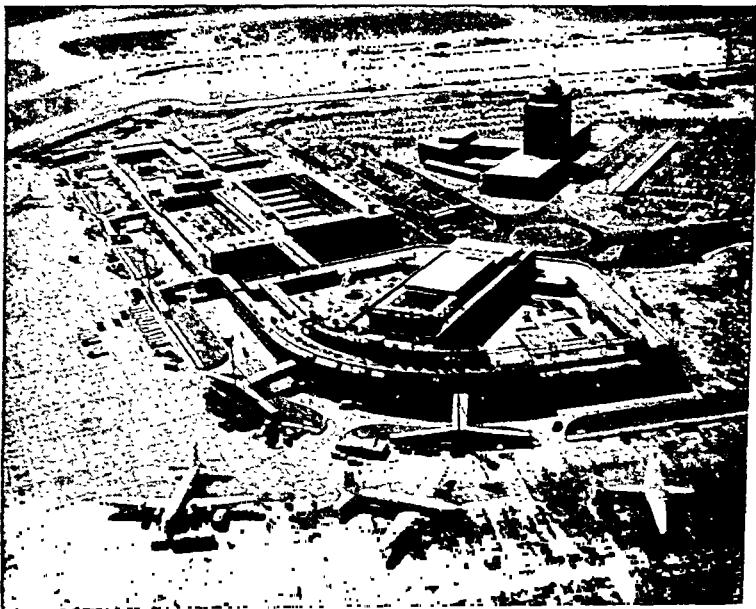
✓ is an announcement for passengers on the BOAC *Comet* Monarch BA.509 to New York. Please take leave of your friends, collect your hand baggage, have your passports ready, and follow the green light to Customs and then to Immigration." You can hear announcements like this at London Airport, where planes take off for all parts of the world.

When passports have been checked, and the other formalities are over, the passengers climb a short flight of steps into the plane. Each passenger settles into a comfortable, padded seat and buckles the safety belt round his waist. (This belt stops him being thrown forward if the plane jolts suddenly before it is safely airborne.)

Meanwhile the luggage has been loaded into place and the crew have checked that everything has been made ready for the flight.

A flight to New York

The aircraft "taxis" from the airport buildings to the end of the



The passenger buildings and Control Tower at London Airport

main runway. Here the pilot waits until a signal from the Control Tower tells him that he can take off. He turns the plane into the wind, opens the throttle, and the plane moves down the runway, faster and faster, until, all at once, the passengers realize that they are airborne.

The crew

The aircraft is controlled by a machine called an "automatic pilot", supervised by the Captain and First Officer. The Wireless Operator listens to the radio for messages from ground stations, weather ships and other aircraft. The Engineer Officer is responsible for the smooth running of the four powerful Rolls Royce "jet" engines.



A De Havilland Comet 4, owned by the British Overseas Airways Corporation (BOAC)

The cabin staff, a steward and two stewardesses, see that the passengers are comfortable in every way. They give them sweets on taking off, and serve each passenger with meals which are warmed in a tiny "galley" or kitchen.

Eight miles a minute

After less than eleven hours' flying the plane lands at New York. For most of the way it has been flying at about 500 m.p.h. at a height of over 35,000 ft. The return flight,

which is often helped by tail winds, may take under seven hours.

Britain's airports

Travel by plane is often more expensive than travel by train or by ship, but it is very much quicker and easier. Every week thousands of passengers fly from Britain's airports: businessmen who are in a hurry, and holidaymakers who want to spend as short a time as possible on the journey.



The steward serves a meal in an airliner

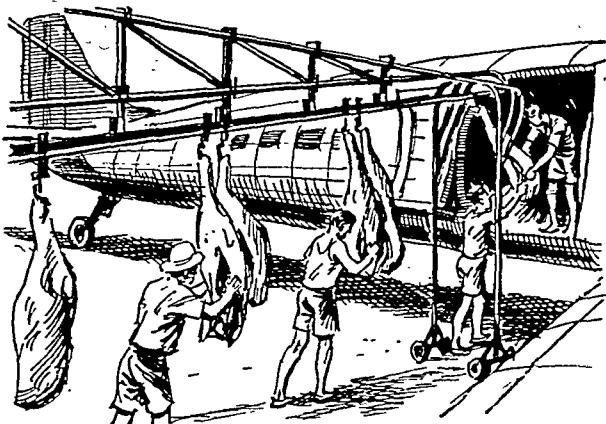
Britain's largest airports are London Airport, Prestwick and Renfrew (both near Glasgow), Ringway (Manchester), Elmdon (Birmingham), and Belfast in Northern Ireland. A new airport has been built at Gatwick, south of London.

Aberdeen, Edinburgh, Leeds, Liverpool, Cardiff, Bristol and Southampton have smaller airports.

In the Kimberleys, an inland slaughter house has been built so that the cattle need to be walked for only about 50 miles. From the abattoir, the carcasses are flown to the meat works at Wyndham, where they are kept in cold storage until they are loaded into refrigerated cargo ships. As a result of the airlift, heavier carcasses of better quality beef can be exported.

Planes are used to fertilise crops, to sow rice seed in swampy areas, and to drop poisoned meat to kill the dingoes. Dingoes are a great nuisance to sheep station owners for they attack the sheep and kill them for food.

Aeroplanes are helping to develop Australia in other ways. Children on the isolated sheep and cattle stations receive their "Correspondence School" lessons on the weekly plane, and as well as the Royal Flying Doctor Service, there is a Flying Dental Service.



Loading beef carcasses into an aeroplane on the "beef airlift"

Aborigines

On the cattle stations, many *aborigines* work as stock boys, breaking in the wild horses and rounding up the cattle. The aborigines (the earliest known inhabitants of the country), arrived in Australia between ten and twenty thousand years ago. Nobody really knows where they came from, but it is thought that they may have travelled from southern India.

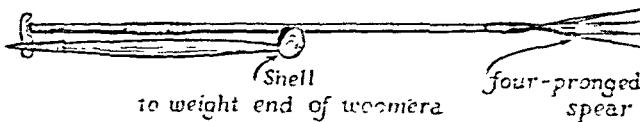


An aborigine with his hunting spear

L.W.—19



Two aborigine boys working in a sawmill



The rocket range town of Woomera is named after the spear-thrower used by aborigines

Even today many of the *myalls* (bush aborigines) live as they have done for thousands of years. They sleep in rough shelters called *gonyahs*, they never cultivate plants for food, and their only animals are half-wild dingo dogs.

The *myalls* are really "stone-age" men. They rub two sticks together to make fire, and hunt for food with a spear, *woomera* and boomerang.

Many of the station aborigines have been educated in mission or government schools, and in some parts of Australia attempts are being made to educate the *myall* children as well, and particularly to teach them English. In South Australia, teachers with jeep-drawn

The baobab, or bottle tree, can live in lands with little rain. It stores up to 80 gallons of water in its trunk



caravans travel round with the nomadic tribes, setting up schools at the water-holes or in the shade of a tree.

Flying over the "Dead Heart"

Mr. Webster, an English engineer, has emigrated to Australia to work on rocket research at Woomera. With his family he arrives by boat at Adelaide, and then flies north to Woomera.

The first part of his journey is over dry country which has barely enough grass for sheep to be pastured. Soon the plane crosses the deserts of South Australia. The desert lands of Australia stretch from the far west of New South Wales and southwest Queensland into part of South Australia, Western Australia and the Northern Territory. Everywhere is so dry and barren that this part is often called the "Dead Heart". For hundreds of miles the flat, dusty plains are covered with foot-high salt bush and clumps of thorny-leaved spinifex grass.



Drovers' horses have a drink near Alice Springs. The windmill pumps up artesian water from deep underground (see page 298)

Scrub country in the outback, near Alice Springs. The earth is red and sandy; the trees are the hardy mulga; the ground is covered with salt bush



Woomera

The town of Woomera has been built in the desert of the "Dead Heart". The rocket range, for testing guided missiles, stretches for over 1,000 miles. This part of Australia was chosen for the range because no people live there, and because there is little possibility of future settlement, owing to the shortage of water.

Many problems were solved before people could make their homes in Woomera. Water was brought over 100 miles by pipeline, and thousands of young trees were planted to provide shade, and to prevent the top soil from blowing away. An airport was made, and a railway line built to join the Trans-Australian line from Perth to Adelaide. This railway is needed for the transport of stores, particularly perishable foods such as milk, butter and meat.

Mrs. Webster finds that most of the food in the shops is grown in Australia. Australia covers such a large area, that there are several different kinds of climate. Both tropical and temperate crops are grown.

In the shops Mrs. Webster can buy sugar and tropical fruits which were grown in Queensland, apples and pears from the cooler island of Tasmania, and grapes, wine and dried fruit from the vineyards of South Australia. Her family eat home-produced lamb, pork and beef, and wear clothing made from the wool of the merino sheep. Even the furniture in her new home is made from Australian wood—from the eucalyptus (gum) tree, and from woods such as walnut, maple and cedar which grow in the coastal jungles of Queensland.



Mackay, Queensland, is in the centre of a large sugar-growing district

A miner in Newcastle

Mr. Hughes, a miner from the Rhondda Valley, has been in Australia for several years. He is now working in Newcastle, a port and industrial town 100 miles north of Sydney.

Newcastle, which is on the New South Wales coalfield, produces good quality coking coal. Some is used in the town's blast furnaces, and some is sent by sea to the gasworks in the industrial section of Sydney Harbour, and to Port Pirie (South Australia) for the lead smelting works.

There are many other places in Australia where Mr. Hughes could work as a miner. Gold is mined at Kalgoorlie (Western Australia), iron at Iron Knob (South Australia), and silver, lead and zinc at Broken Hill, New South Wales. There are rich deposits of uranium at Rum Jungle in the Northern Territory, at Radium Hill in South Australia, and at Mary Kathleen in Queensland.

In summer, when Mr. Hughes has finished his shift in the mine, he often goes surfing from one of Newcastle's beaches. Sydney's Bondi and Manly



A rock drill at the Rum Jungle uranium deposits



These surf riders have caught a big wave at the right moment

beaches are the best known, but there are hundreds of miles of magnificent beaches stretching along the Pacific coast, from New South Wales into Queensland.

Sunshine and sport

Australia has a great deal of sunshine. About a third of the continent, north of Alice Springs, is in the tropics. Perth, the sunniest state capital, has an average of almost eight hours' sun a day.

In Australia, thousands of city dwellers live within a short bus or train ride of the beaches. In the summer, at weekends and at holiday times, the people flock to the sea, or go fishing, bush walking, horse-racing or sailing.

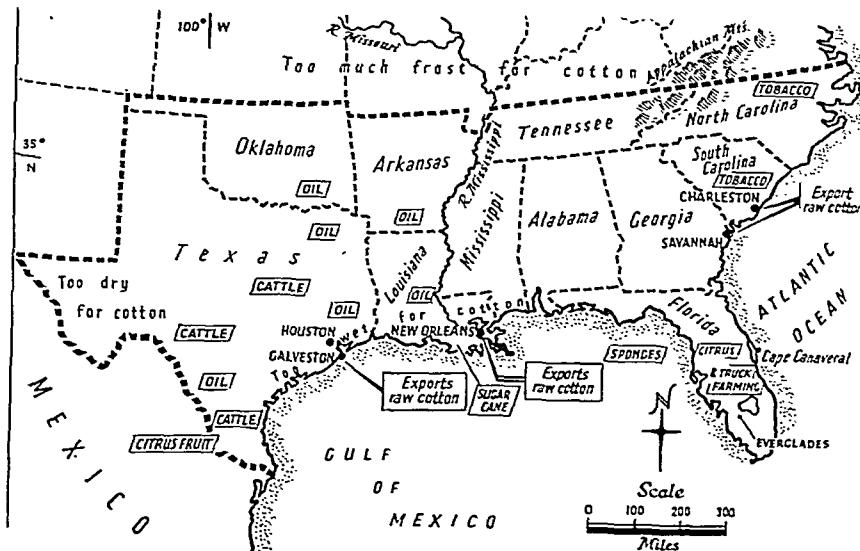
Although the country has a population of only ten million, the Australian's love of sport, and the long sunny summers, have produced many of the world's leading cricketers, swimmers, athletes, golfers and tennis players.

6. THE SOUTHERN STATES OF THE U.S.A.

The United States of America is a huge country of forests and mountains, deserts, plateaus and vast plains. Most of the country has a temperate climate (*temperate* means moderate or mild). You will read about the temperate parts of the country in Chapter 14.* In this chapter you will read about the Southern States, which have a hot climate.

Here is a map of the Southern States. In the east, there is a range of mountains called the Appalachians, but most of the states consist of plains. The River Mississippi, which is over 2,000

* On page 318 is a map of the U.S.A.



miles long, flows through the centre of these states into the Gulf of Mexico.

Fertile land, a long growing season, and warm, sunny weather all help to make agriculture the chief occupation of the people of the south.

Crops

Cotton is the most important crop. It grows well from eastern Texas to North Carolina, where there is rarely any frost. The ripe bolls are picked by machine or by hand, and taken to a factory where the seeds are torn from the fluffy lint. Three-quarters of the cotton crop is used in the country's textile factories ; the remainder is exported. The chief ports for the export of cotton are Galveston and New Orleans on the Gulf of Mexico, and Charleston and Savannah on the Atlantic coast.

Soya beans, groundnuts (peanuts) and maize are also grown by the farmers of the south. They sell the maize to poultry farmers ; the oil from the groundnuts and soya beans is used to make margarine.



The mechanical cotton picker works like a vacuum cleaner

Tobacco is grown mainly in the south-eastern states of North and South Carolina, Georgia and Florida. These states have factories where different varieties of tobacco leaves are made into cigarettes, cigars and pipe tobacco.

Along the low-lying coast of the Gulf of Mexico, the land is too wet and marshy for cotton, but the moist climate and hot summers (over 80° F.) provide the right conditions for growing *rice* and *sugar cane*. Most of the sugar cane is grown near New Orleans, in the delta of the River Mississippi.

Citrus fruit

Citrus fruits, especially oranges and grapefruit, are grown in Texas and in Florida. These fruits are sent all over the United States, as well as to Great Britain and other countries whose climates are too cold for "sub-tropical" crops. Some of the fruit is sent to juice-canning factories. The pulp and rind are dried and made into fertilizers and cattle food.



The tobacco farmer removes the flower bud and top leaves to strengthen the rest of the plant



A truck farmer and his son, from Louisiana, with a load of shallots (green onions)

Truck farming (market gardening)

Truck farmers in the southern states, such as Florida, where the winters are mild, grow early vegetables for the industrial towns of the north-east.

(Truck farmers take their name from the trucks—lorries—which carry their produce to the towns.) The main crops are potatoes, tomatoes, green vegetables and onions.

Cattle rearing

The climate becomes drier towards the west. Western Texas, for instance, is too dry to grow cotton. Instead, vast herds of cattle are pastured on miles of rolling grasslands. The biggest cattle ranch in North America is in Texas; it covers over a million acres, a greater area than the English county of Hampshire.

Coconut growing

Many Fijians are farmers, working on coconut plantations, or growing coconuts on their own land. When the nuts are cut from the trees, they are enclosed in a brown husk two or three inches thick. The islanders split open these husks and use the fibre as fuel for their fires.

The most important part of the nut is the *kernel*. The kernels are dried in the sun, on racks over smouldering fires, or in mechanical driers. When the white coconut flesh shrinks and becomes brown in colour, it is called *copra*.

In the picture you can see a copra collecting boat. The sacks are ready to be loaded into the hold and taken to Suva, where the oil is squeezed from the copra for use in the manufacture of soap and margarine. Both copra and coconut oil are exported to Great Britain.

The sugar cane industry

A great deal of sugar cane is grown on Viti Levu, but very few Fijians earn their living in the sugar industry. Most of the cane growers and workers in the crushing mills are descendants of the Indians who were brought to Fiji 80 years ago. Today, there are more Indians than Fijians in the Fiji Islands.

Banana farming

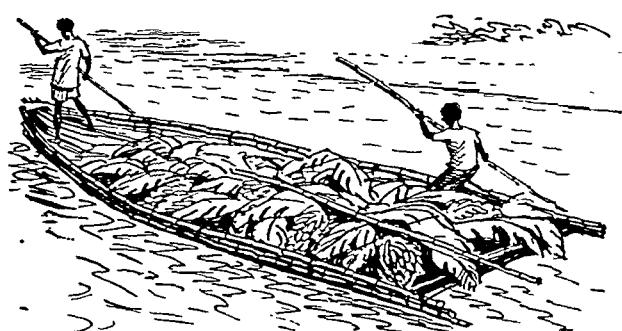
Some Fijians grow bananas, planting them in fields beside the rivers. The bananas are cut while green, loaded on to bamboo rafts or flat-bottomed punts, and taken down the rivers to packing stations. Nearly all Fiji's bananas are bought by New Zealand.



Removing coconut kernels from their husks



The copra collecting boat calls at the islands two, or three times a year



Bamboo rafts are used to transport the bananas



A village primary school

Education in the Fiji Islands

Most Fijian villages have a primary school for the children of the village. When it is too hot in the classroom, the children have their lessons outside, in the shade of the coconut trees.

The secondary schools are mainly on the island of Viti Levu. Nearly every secondary school is a boarding school with a farm attached where the children grow the food they eat, such as bananas, breadfruit and the

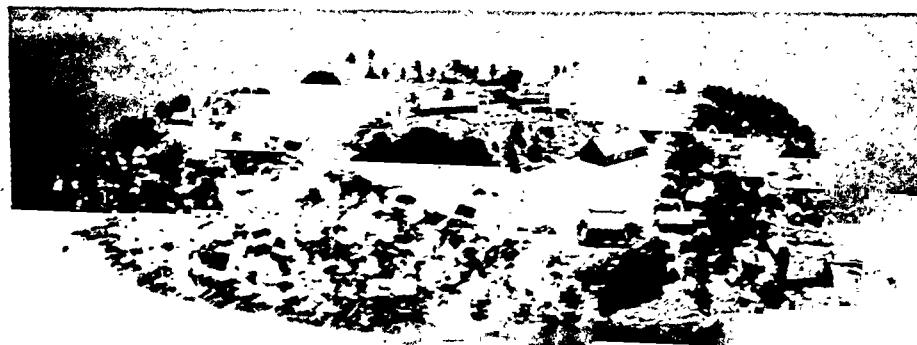


The dining-room of a secondary school for Fijian boys

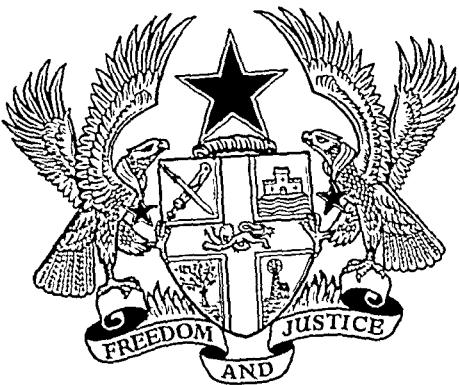
starchy roots of the *cassava* plants.

Fijian children are good at games. The boys play football without boots, and cricket in cotton kilts called *sulus*. (On page 281 there is a drawing of a Fijian policeman wearing a *sulu*.) The girls play rounders and basketball.

More and more children in Fiji and the other British Pacific Islands are going to the secondary schools, so that afterwards some of them can train to be doctors, nurses and teachers.



The island of Bau, home of a family of chiefs



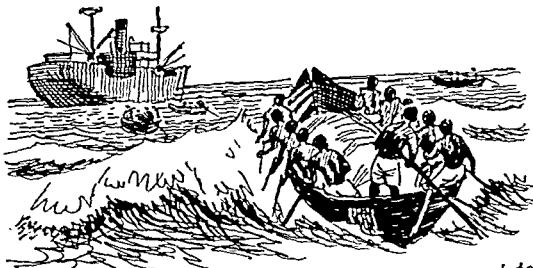
The Coat of Arms of Ghana

8. GHANA

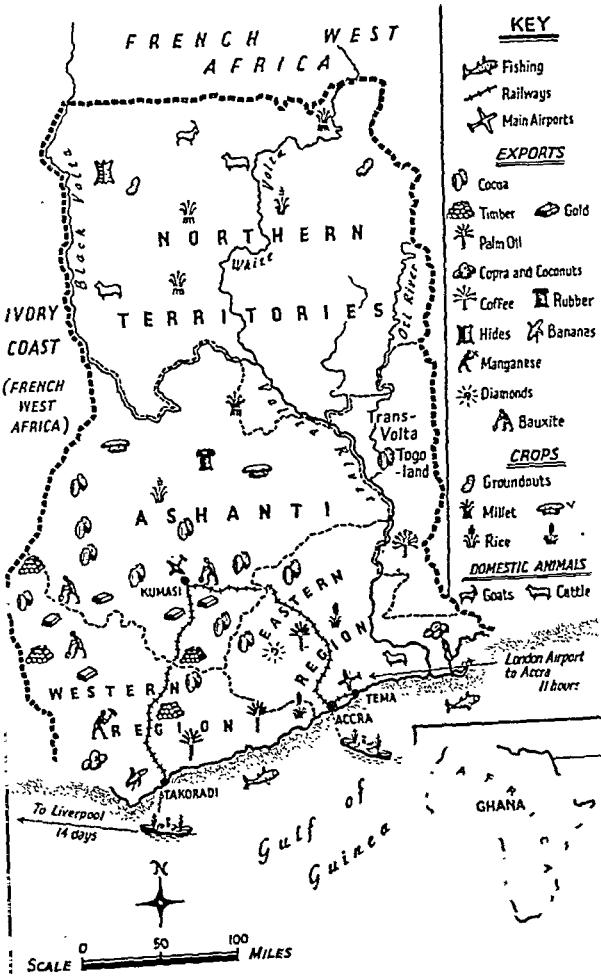
More than four hundred years ago, European traders visited the Guinea Coast of West Africa. The gold dust they bought from the negro chiefs was so pure that coins (guineas) made from it, were worth 21 shillings instead of 20. For a long time part of this coast was called the Gold Coast, and was ruled by Great Britain. Today, although the country is still part of the British Commonwealth, it is governed by its own people, and the name of Gold Coast has been changed to Ghana. (Ghana is the name of an ancient African kingdom which has long since disappeared.)

Surf boats and harbours

The coast of Ghana is fringed by a belt of surf which breaks heavily on the



Surf boats are still used to take cargoes out to ocean-going ships



The products of Ghana

beach, and there are no inlets large enough to take ocean-going ships. Instead, ships anchor beyond the breakers, and surf boats ferry their cargoes ashore. This even happens at Accra, the capital.

But soon the surf boats may disappear from this part of the Gulf of Guinea. Takoradi has a man-made harbour with an artificial breakwater to stop the force of the Atlantic rollers, and at Tema, 17 miles from Accra, another port is being built.



A new housing estate at Kumasi in the Ashanti cocoa-growing area. The ditch at the side of the road carries away the heavy rains of the rainy season. The trees are pawpaws, which have a juicy, golden fruit

In Accra, as in other towns throughout Ghana, tall, concrete office blocks and self-service stores are being built alongside the native markets. At Kumasi, the chief town of the Ashanti cocoa-growing area, and in other towns, there are new housing estates, like the one in the above picture.

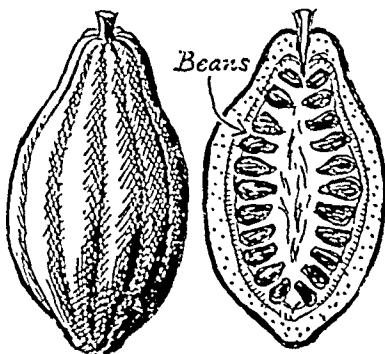
Cocoa

Cocoa is the most important crop grown in Ghana. Cocoa and chocolate are made from the beans of the cacao tree. This tree must have shade, heat and the heavy rainfall of tropical forests. In the south of Ghana, in the Ashanti forest region, there is ideal country for growing cacao trees.

Kofi (his name means Friday), is an African farmer who earns good money by cultivating cacao trees. Most of the cacao crop is grown on small farms owned and worked by men like Kofi. He cuts the lower pods from the tree with a sharp cutlass, and uses a knife on a long pole to cut down the higher pods. The pods are yellow when ripe, with a leathery rind about half an inch thick.



Cutting the pods from the cacao tree. They grow from the trunk as well as from the main branches

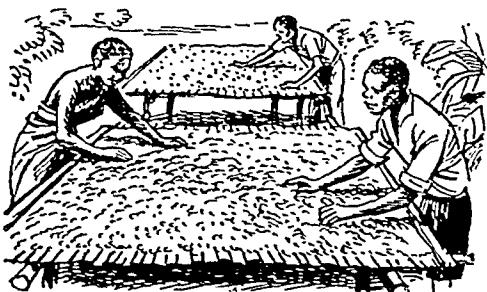


Inside each pod are twenty to thirty cream-coloured beans

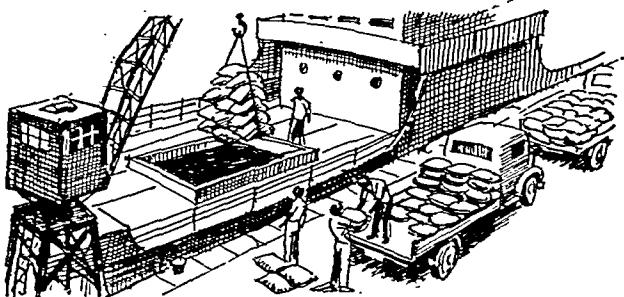
Kofi splits the pods in half, takes out the beans, which are surrounded by a sticky pulp, and covers them with banana leaves to protect them from the rain. Then they are left for a week to ferment, or "sweat". This improves the quality of the cocoa.



The beans are covered with banana leaves to protect them from the rain, and are then left to "sweat"



Spreading the beans on raised trays, so that they will dry in the sun. Every day the beans are raked, so that they will dry evenly



Cranes on the dockside load the sacks of beans into the holds of the ship

The beans are taken to the compound and spread on tables where they dry in the hot sun for several days. Then they are poured into sacks and taken by lorry to Accra or Takoradi where they are loaded into the holds of cargo boats and exported.

The diagram on the right shows the year's work of the cocoa farmer. He gathers two crops, a main crop between October and December, and a very much smaller crop between March and May. His work is regulated by the seasons of the year. The dry season is followed by the "big rains", which are followed by the "little rains". Between the harvests, much work has to be done on the farm.



The year's work of a cocoa farmer



An Agricultural Station in the savannah. The cattle are being sprayed to protect them from the bite of the tsetse fly

The savannah

Beyond the forest region, and stretching for hundreds of miles to the southern edge of the Sahara desert, there is open grass country, or *savannah* land. Here, in the hot, dry Northern Territories of Ghana, cattle are reared and yams, maize, millet and groundnuts are grown.

Although the Black and White Volta rivers never dry up completely, there is usually a great shortage of water, and if the rainy season is late, the smaller rivers and waterholes become dry. In some areas, dams have been built on the tributaries of the Volta to hold back a supply of water for irrigation. Water in the dry season allows the people to grow rice and tobacco.

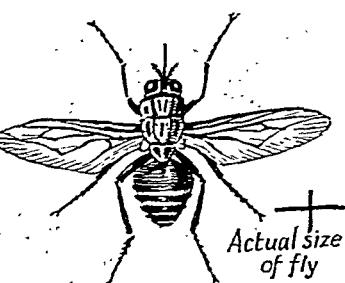
Palm oil

The coloured picture opposite shows part of a village in Ghana. The women are preparing and boiling palm fruits. Palm oil is obtained from the fleshy outer covering of the fruits. Palm kernel oil is obtained from the kernels. Both these oils are used in soap and margarine making.

The tsetse fly

The African farmer's greatest pest is the tsetse fly. This insect, common over all tropical Africa, makes it difficult for him to keep cattle and domestic animals, for its bite causes a disease which makes the cows thin and weak. The tsetse fly also attacks human beings, who then suffer from a disease called "sleeping sickness", which makes them continually drowsy and unable to work, until finally they lose consciousness and die.

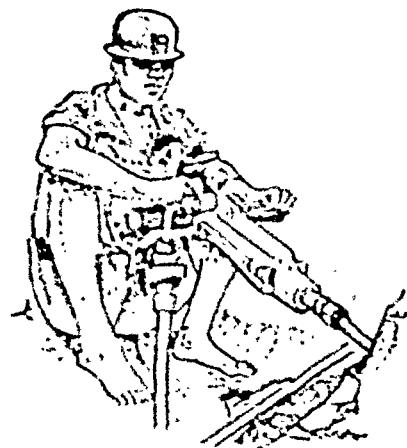
The tsetse fly is related to the house fly. On the front of its head is the "needle" used for skin piercing and blood sucking



Great efforts are being made to wipe out the tsetse fly. The undergrowth, where the females breed, is being cleared, and pools of stagnant water are being sprayed with insecticides, so that the Africans can return to areas where it was once unhealthy to live.



Sufferers from leprosy being treated at a "Land-Rover" clinic. Some of them may have walked as far as ten miles for treatment



A gold miner drilling a hole so that the ore can be blasted out. Early miners "panned" for gold in river beds. They washed the light sand from the heavy gold

Throughout Ghana, particularly in the north, people still suffer from leprosy. There are some leper settlements, but thousands of patients live normal lives in their villages, and have

weekly treatment from "Land-Rover Clinics" which travel through the country districts. With the use of modern drugs, patients are often cured after two years' treatment.



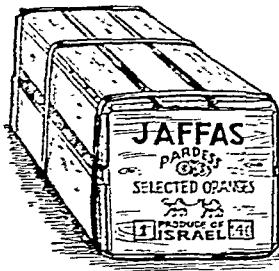
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Ghana, like many countries in Africa, is changing rapidly. Many Africans are moving away from their villages to work in the towns where there is electricity instead of paraffin lamps, and piped water instead of a well.

places which have springs and underground water. As well as irrigating the land, the people terrace the hill-sides so that heavy rain does not rush down them, carrying away the soil. They also dam the rushing streams which dry up in all but the wet weather. Scientific methods, heroic hard work and the use of modern machinery are enabling the Israelis to grow crops on land that was desert until a few years ago.



Jaffa oranges and blossoms



A crate of Jaffa oranges



Pineapples grow in many hot countries. The fruit grows just above the ground in a mass of slender leaves. It is yellow when ripe. Many pineapples are tinned

The people of Israel now grow three-quarters of all the food they eat. They produce all the vegetables, potatoes, eggs and fruit they need, and are able to export some fruits. Pineapples, grapefruit, grapes and the famous Jaffa oranges are sent to the ports of Haifa and Jaffa, to be exported to Britain and other countries.

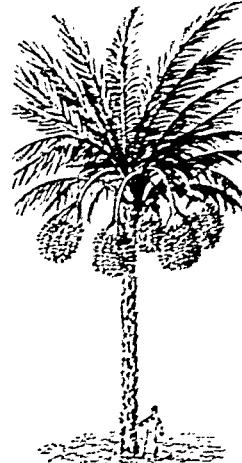
In the hotter, wetter parts of Israel, such as the Jordan Valley, pomegranates, guavas and mangoes are grown. All the time, experiments are being made to grow new crops such as sugar beet, cotton, groundnuts and tobacco.

The people who work on the land usually live in small villages. When a new village is being built, young men and women from the Army are often sent to help.

The Kibbutz

On the marshy plains of Israel, and in the stony hills, many Jews have found that the best way of working the land is to live in groups, or settlements. One type of settlement is called a *Kibbutz*. Its members live together and share everything. Instead of being paid wages, they receive their food, clothes and shelter (a bungalow or a bed-sitting-room).

One of the first and finest houses to be built in a *Kibbutz* is the Children's House. Here the children live while their fathers and mothers are working. The children spend the evenings and holidays with their parents, but they go back to the Children's House to sleep.



Date-palm trees grow in hot, dry deserts wherever there is underground water. Dates are brownish when ripe and are valuable food for men and animals. The dates we eat have been dried in the sun



In hot countries, fig trees produce two or three crops each year. The figs sent to Britain are dried in the sun or in ovens



Some of the houses and workshops of a Kibbutz

Many Kibbutzim now have their own small factories, libraries and museums. Some of these settlements have as many as 2,000 people living in them. The members have regular meetings to decide all the affairs of the Kibbutz, and they elect managers to be in charge of each department—the factory, the dining hall, the Children's House and so on.

The factories of the Kibbutzim usually make the things needed by their own members—furniture, clothes, shoes or hardware—but they may also sell their surplus goods elsewhere.

The factories

Much of the money needed by the state of Israel is given by Jews in other countries; but the government wants to produce more goods for export, in order to bring more money into the country. The people are encouraged to set up

factories, particularly in remote parts of the country, where use can be made of local raw materials. Potash, salt and other minerals found in the Dead Sea are used in the chemical factories. Minerals such as copper, several types of china clay, and sand for glass-making are found in the Negev, and so Israel has metal, pottery and glass industries. Cotton is made into clothes and locally grown fruit is tinned. The polishing of diamonds is also an important industry.

Many of the factories are small, but, as most of them have come into existence since 1948, they are very efficient.

Most of the goods imported and exported are shipped through the ports of Jaffa and Haifa, but gradually the port of Eilat on the Gulf of Akaba is being improved to give Israel a direct route to the Far East and to East Africa.

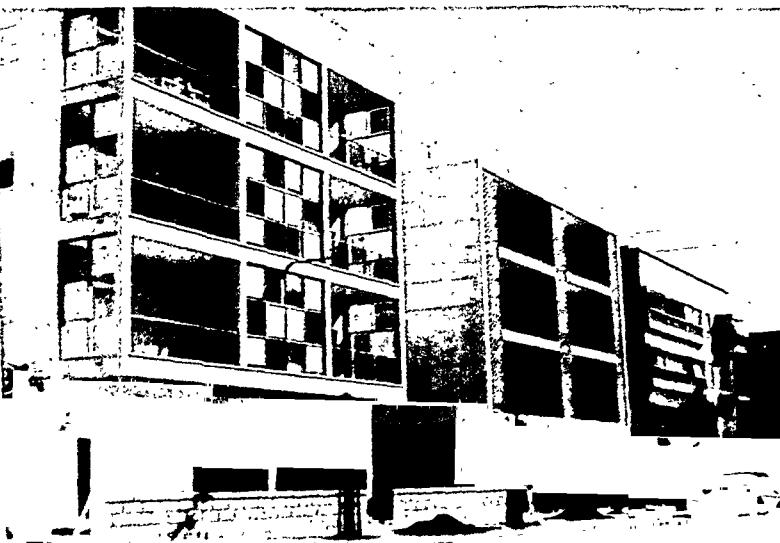
Israel today

Many of the towns are a mixture of old and new. The old parts have narrow lanes and dark, stone houses. The new parts of the towns have been laid out with trees, squares and wide roads. Beersheba, the market town for the nomadic tribes of Arabs, has a modern shopping centre with hotels, factories and a large cinema.

Beersheba is the southern terminus of the railways. Few towns are linked by railway although more lines are being built. There are many fine asphalted roads. One of the best new roads is from Beersheba southwards to Eilat. In 1948 Israel had 4 ships and 2 civilian planes. Now she has more than 40 ships (most of them cargo ships, used particularly for carrying citrus fruits). "El Al" airways have regular flights to America, Europe and South Africa, as well as many internal air routes.



Via Dolorosa, Jerusalem. A lane in one of the old parts of the city



These modern flats in Tel Aviv have balconies where the residents can enjoy the fresh air while being shaded from the sun

Israel has made great progress since 1948. Tremendous effort by her people, and a great deal of money from other countries, have enabled her to grow most of the food needed by her ever-increasing population. The Israelis have shown how a hot, dry country in the Middle East can have a standard of living similar to that of Western Europe.

Let's Remember

THE HOT LANDS

Many things help to decide the climate of a country. Here are some of them :

1. *The distance from the equator.* Equatorial lands are hot, polar lands are cold.
2. *The height of the land.* The higher the land, the cooler the climate.
3. *Distance from the sea.* Lands near the sea have a less extreme climate than lands in the middle of continents.

If we think about these things, we find that there are several kinds of hot lands with different types of scenery and climate.

1. The equatorial forests

At the equator, where the sun is almost directly overhead all the year round, there is little difference in temperature between one month and another, or between night and day. The temperature is rarely more than 90° F., but there are thunderstorms and heavy rain almost every afternoon.

In the dense tropical jungle which grows in the lands around the equator,



Equatorial forest: Brazil

it is damp and oppressive. So much rain falls that the ground is often swampy and there are many wide rivers.

Tropical forests cover the basin of the River Amazon in South America, of the River Congo in West Africa, and the lands of Malaya and Indonesia. Few people live in these forests.

2. The tropical grasslands

A little to the north and south of the equator it is very hot and rain falls only in summer. There are wide open spaces covered with coarse grass and a few scattered trees which can withstand the drought of the winter months.

Where the tropical grassland, or *savannah*, has been cultivated, crops of coffee (Brazil), cotton (the Sudan), sugar cane or millet are grown. But the main use of the savannah is for rearing cattle.

The savannahs are found north, south and east of the Congo basin in Africa, in the Guianas (where they are called *llanos*), in Central Brazil (called *campos*), and in Northern Australia.



Tropical grassland: Bechuanaland. The grass is poor, but cattle can live on it if they move around



*Tropical monsoon land : Ceylon.
Wash-day in a mountain stream*

3. The tropical monsoon lands

The countries of India, East Pakistan, Burma, Thailand and Indonesia have three distinct seasons each year : the cool season, the hot season, and the hot, wet season.

Where the rainfall is very heavy, tropical jungle grows. Many of the trees are deciduous hardwoods such as teak. Where the land has been cleared, rice is the main crop. Other crops are tea (particularly in Assam), jute (the Ganges delta), rubber (Malaya), cotton and sugar cane.

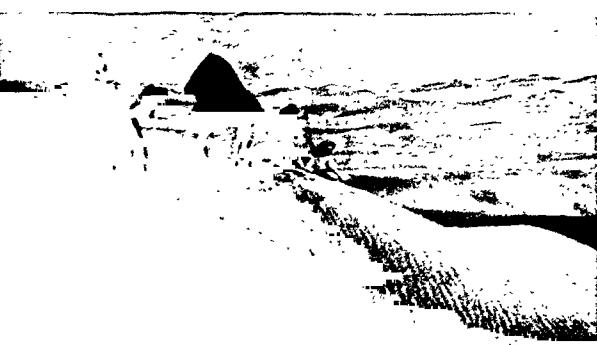
4. The hot deserts

To the north and south of the savannah lands are deserts which have less than 9 inches of rain a year, and frequently no rain at all. A fierce sun shines from a cloudless sky and very little can grow. In summer it is very hot during the day (110° F. or so), and very cold at night. The winters are cooler. When rain falls, a mass of small plants grows quickly and makes its seeds, but for most of the year only a few thorny bushes and cacti can survive the drought.

Some of the inhabitants of the desert are nomadic herdsmen ; others are oasis-dwellers who grow date palms and keep cattle, sheep and goats. Oil has been found in the deserts of Arabia and in the Sahara Desert, gold in Australia and nitrates in Northern Chile.

The largest area of desert stretches from the Sahara in North Africa across Arabia to Northern India. Other deserts are the Kalahari desert in South Africa, the desert of Central Australia, and the deserts of Northern Chile and of Mexico.

A hot desert : the Sahara, Africa



To mine diamonds, the bluish-green rock under the surface of the earth is dug up, crushed and washed so that any diamonds can be picked out. (Many tons of rock are mined to find each diamond.) The diamonds are usually exported in their "rough" state to be cut and polished in Amsterdam, Antwerp or Israel.

The diamond mines in South Africa are owned and managed by "Europeans"; the Bantu do the digging and labouring.

Half the world's gold comes from South Africa, most of it from the mines near Johannesburg. Like diamonds, gold comes from deep down in the ground, and huge dumps of blue-grey soil are to be seen all round Johannesburg.

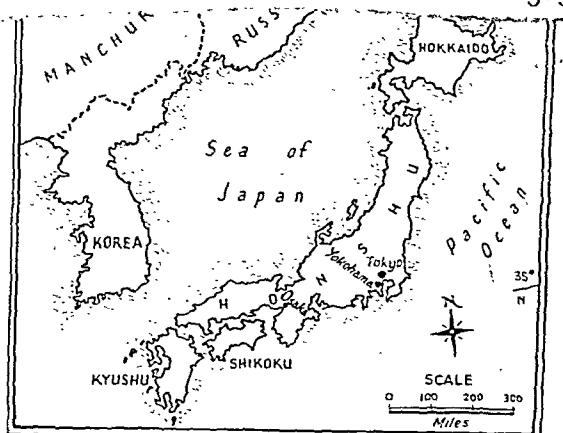
The land

South Africa is a large country, five times as big as Britain.

Although it is the same distance from the equator as Egypt, it is not nearly so hot, for most of the country is a high plateau, about 3,000 ft. above sea level. Around the coast is a strip of low land.

The story of South Africa

Until the seventeenth century the only people in South Africa were the original natives, the Bushmen and the Hottentots, and the Bantu Africans who had come from farther north. Then the Dutch set up a post where ships trading with India and the Far East could pick up water, vegetables and meat. In the years following, many people from Europe, particularly from Britain and Holland, went to South Africa to settle.

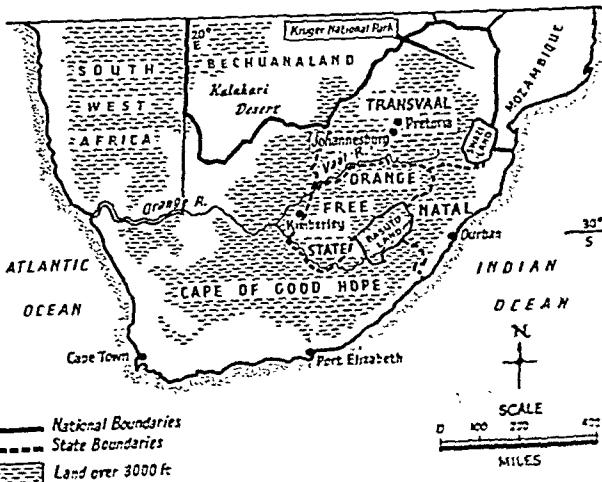


winds sweep across the sea from the north of Russia, bringing snow for four or five months of the year.

The people

Over 90 million people live in Japan, a very large number for such a small country. How do so many people

Gradually the settlers moved eastwards, until they met the Bantu people, and fighting began for the ownership of land and cattle. The settlers, who had firearms, conquered the Bantu. Then the settlers quarrelled amongst themselves, and in the Boer War the British fought the Dutch-speaking "Boers".





Tropical monsoon land : Ceylon. Wash-day in a mountain stream

3. The tropical monsoon lands

The countries of India, East Pakistan, Burma, Thailand and Indonesia have three distinct seasons each year : the cool season, the hot season, and the hot, wet season.

Over 1 million are "Coloured" (partly negro, partly European and partly descended from slaves who were brought from the east).

Almost $\frac{1}{2}$ million are Indians (some of them are immigrants from India ; others are descendants of labourers who came to Natal to work in the sugar-cane fields and the tea plantations).

The government of South Africa is in the hands of the "whites". They believe that each race in the country should live a separate life, and should not be mixed with the others, as has

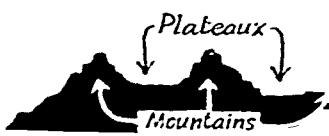
4. The hot deserts

To the north and south of the savannah lands are deserts which have less than 9 inches of rain a year, and frequently no rain at all. A fierce sun shines from a cloudless sky and very leaders. This policy is called *apartheid*, which means "separateness".

Diamonds and gold

Most of the wealth of South Africa has come from under the ground, for many kinds of minerals are mined there. When diamonds and gold were first found in South Africa, almost a hundred years ago, men rushed there from all parts of the world. New townships sprang up almost overnight, and all around Kimberley and Johannesburg men were frantically digging for gold.

The diamond is a very hard stone which can be cut and polished so that it flashes with every beam of light which catches it. It has always been the most prized of jewels. Today, because of its hardness, it is also used in industry, for cutting and grinding, and for making the bearings of watches.



Much of South Africa is a high plateau, or tableland

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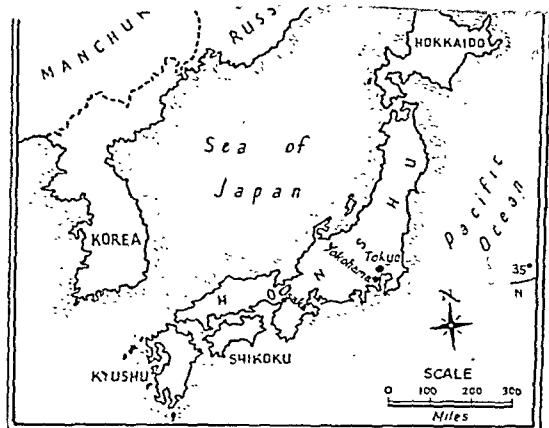
To get an ounce of pure gold, three tons of ore have to be mined, crushed, and treated.

Uranium and other minerals

Uranium has recently become very important, for it is radio-active and is used in the making of atomic power. It is extracted from the rock which is dug up in gold mining. Uranium is now South Africa's second most important export. Iron ore, manganese and copper are also mined in South Africa.



Maize is a grain crop grown in many hot countries. It grows 6-10 ft. tall, with several "cobs" on each plant. In South Africa it is called "meaties" and is very popular with the Bantu people



winds sweep across the sea from the north of Russia, bringing snow for four or five months of the year.

The people

Over 90 million people live in Japan, a very large number for such a small country. How do so many people make a living on so little land? The answer is that they work hard, and live simply. Their food is plain, and their houses, by Western standards, are

Farming

South Africa is a land of sunshine, and for months on end there are clear, blue skies and a warm sun.

Fruit grows well, particularly in the south-west of the country, around Cape Town. The summers are hot and dry and the winters are warm and rainy. This sort of climate is often called "Mediterranean". It is the same climate as that of Italy, Greece and California in the U.S.A., which are also famous for their fruit.

South Africa has its summer when the northern hemisphere is having winter, so that its fruit reaches Britain just when it is most needed.

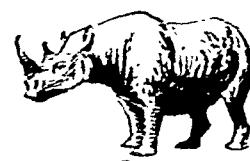
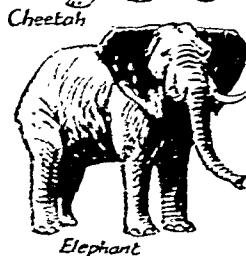
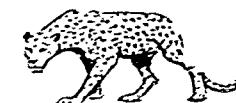
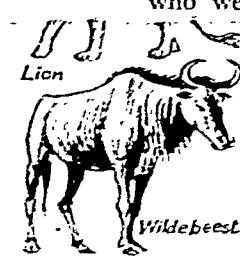


3. The tropical monsoon lands

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Over 1 million are "Coloured" (partly negro, partly European and partly descended from slaves who were brought from the

many animals, as famous for big-game hunting. Lions, elephants, hippopotami and all kinds of animals and birds were hunted, until there was a danger that some of them might become extinct. To safeguard the animals, and to allow people to see them in their natural surroundings, nature reserves were set up. In these areas the hunting of animals is forbidden.



The largest reserve in South Africa is the Kruger National Park, which is larger than the whole of Wales. As you drive through the park, you may see a herd of elephants ambling across the road, a giraffe nibbling the leaves of roadside trees, or a lioness lying asleep on the track, with her cubs playing around her.

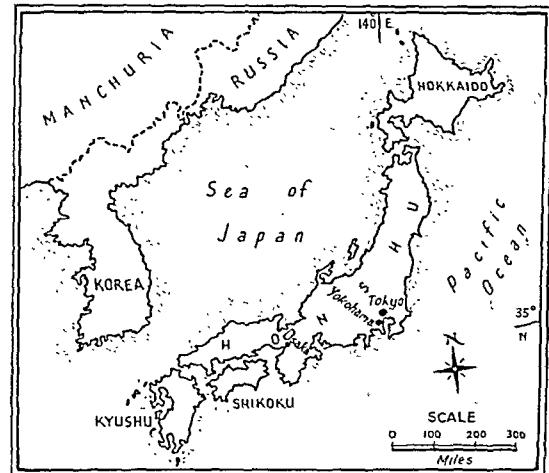
The country of Japan is made up of a long string of islands which stretch along the eastern shore of the continent of Asia. There are four main islands and hundreds of smaller ones. The chief cities are on Honshu, which is about the size of Great Britain.

Three-quarters of the country is mountainous, and nearly everyone in the islands lives on the narrow plains which border the sea. Two great cities on these plains are Tokyo, the capital, with its port of Yokohama, and the great industrial centre of Osaka.

The climate

The islands of Japan stretch so far from north to south that the climate is very varied. Hokkaido, in the north, is a cool, temperate land, while Kyushu, in the south, is a hot land.

Although Hokkaido is nearer to the equator than Britain, it has a colder winter. This is because biting, icy



winds sweep across the sea from the north of Russia, bringing snow for four or five months of the year.

The people

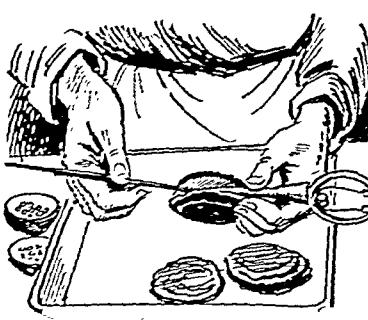
Over 90 million people live in Japan, a very large number for such a small country. How do so many people make a living on so little land? The answer is that they work hard, and live simply. Their food is plain, and their houses, by Western standards, are simple. A hundred years ago Japan was a backward country, having no contact with the outside world. Today she is one of the busiest of nations, with factories making cameras, motor scooters, toys and many other things which are sold to other countries.

During the day most Japanese wear European clothes. But at home they usually wear the traditional dress, including the loose robe called the *kimono*.

In the coloured picture opposite you can see a Japanese family eating their evening meal of rice flavoured with sauce made from soya beans. The bowls on the table contain bamboo shoots, raw fish and cucumber.



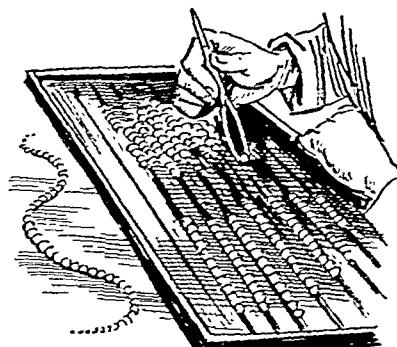
Both traditional and European dress are worn by the people of Japan



Placing a bead inside an oyster



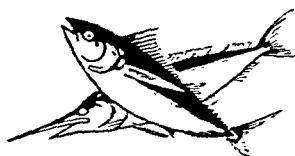
The cages of oysters are put in the sea



Grading pearls for making necklaces

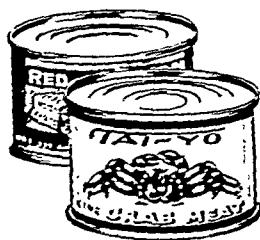
Fishing

Japan has little good farm land, and to feed her large population cheaply, she depends a great deal on fish. In the villages near the sea, the women work in the small rice patches, while the men earn their living by fishing. Most of the boats work around the long, irregular coast, where the fish are plentiful, but there are also many trawlers which make longer trips.



Frozen goods :
tuna, swordfish,
rainbow trout,
frogs' legs, etc.

Tinned goods :
crab meat, tuna,
sardines, salmon,
oysters, etc.



The Japanese live mainly on rice and fish. Here are some of the many kinds of fish which Japan sells to other countries

Pearl "farming"

Many people round the coast earn a living by trading in pearls. Pearls are beautiful "stones" which are sometimes found inside shellfish called oysters. They are made into rings, necklaces and ear-rings.

If a grain of sand or a tiny sea creature gets between an oyster's body and its shell, it irritates the oyster, which covers the "foreign body" with a whitish milky substance. When this substance hardens, it makes a pearl. As real pearls are difficult to find, the Japanese grow "cultured" pearls in oysters which they breed in the shallow water close to the shore. This is called pearl farming.

To start a cultured pearl, each oyster has a tiny bead placed inside it. Then the oysters are put in cages which are tied underneath rafts in the sea. At the end of two years, perhaps half the oysters will have made pearls.

Cultured pearls cost only $\frac{1}{25}$ of the price of natural pearls, but they are almost as beautiful. Japan sends cultured pearls all over the world.

Farming

Farm land is scarce in Japan, for much of the land is mountainous and less than one-sixth of it can be farmed. Much of this land is poor, but it is well farmed and good crops are grown. Mr. Sato has a farm on the crowded plains of Honshu. Here the farms are very small; each has only about three acres of land. (An acre is about the size of a football pitch.)

Most farms are made up of several scattered plots, instead of having all the fields in one place. Some of these plots are on the flat plain lands, while others, only a few feet wide, have been made on the slopes of the mountains. They look like giant steps.

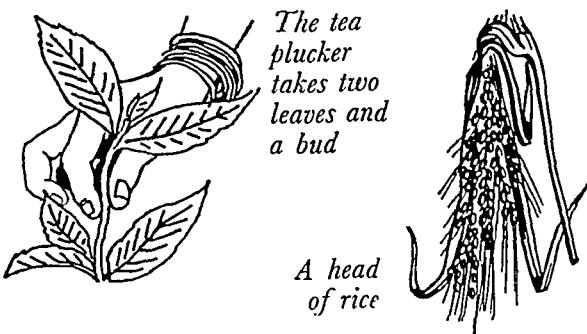
The fields are so small and the country so mountainous that the farmers are unable to use tractors or similar big machinery, even if they could afford them. The Sato family has an ox for ploughing, but no horses



Picking tea from bushes grown on the terraced fields of a hillside. Rice is growing on the plains below

or cows. There is some dairy farming on Hokkaido, but the land on the other islands is needed to grow food, and cannot be spared for cattle. Grazing land in Japan is so scarce that butter often costs ten shillings a pound.

Mr. Sato plants two crops a year. Rice is grown in the summer, and after the autumn harvest the land is ploughed again. In winter and early spring the same fields will grow wheat and barley. Because land is so scarce, every inch of the farm is cultivated, and even the banks dividing the fields are planted with tea bushes and mulberry trees.

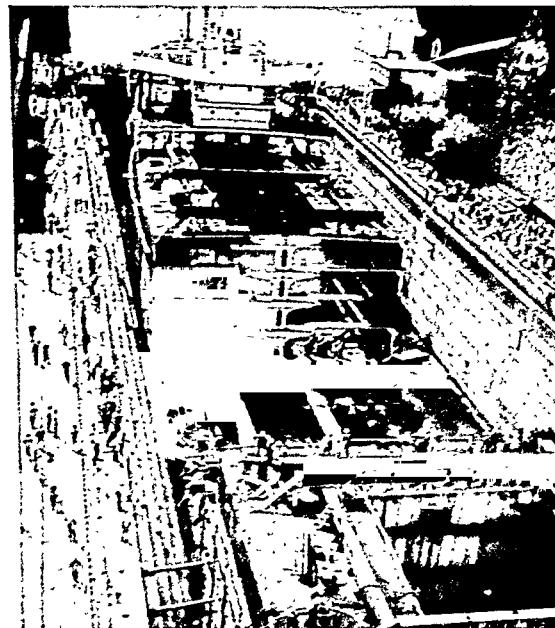


Silkworms feed on the leaves of the mulberry, but the Sato family keep fewer silkworms than they did in the past because nowadays many artificial fibres are used instead of pure silk.

A farmhouse in Honshu

The Satos' farmhouse is made of wood with a thatched roof of rice or wheat straw. As there are so many earthquakes in Japan, the rooms of the house are separated not by walls, but by sliding panels of thick, white paper. (Brick walls would be dangerous if they fell, and they would be difficult to rebuild.) Even the outside walls are only waterproof squares of paper glued on to a light wooden trellis work.

Inside, the house is simply furnished. In winter, instead of fires, the rooms are warmed by big earthenware tubs lined with copper and filled with lighted charcoal. There are no beds, and at night thick, padded quilts are laid on the rush mats which cover the floors.



A Japanese girl writing a letter. She uses a brush and paint to "draw" the words. Here are two Japanese words:

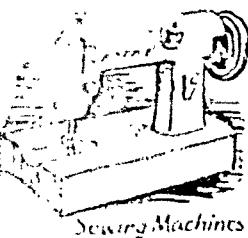
お米 Rice お茶 Tea

Japan's imports and exports

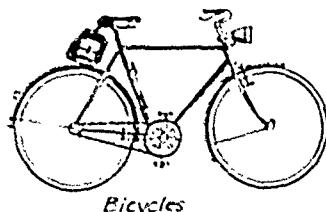
To feed all her people, Japan has to buy from other countries foodstuffs such as rice, sugar, wheat and soya beans. In order to pay for this food she must manufacture goods and export them.

The country has few raw materials. She has to import petroleum, bauxite for making aluminium, and iron-ore and coking coal for her iron and steel industry. She also buys wool from Australia and cotton from the U.S.A.

Japan is one of the world's great ship-building nations. The two halves of this ship have been built separately; they will be joined together in the dry dock



Sewing Machines



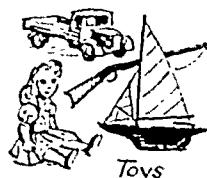
Bicycles



China



Cameras



Toys



Tinned Mandarin Oranges

Some of the many things exported by Japan

Japan has some coal and copper, pine trees for the match industry, and clay for making china and earthenware. Hydro-electricity from the mountains provides power for many of the factories.

With these resources, and because of the low standard of living of most of the people, Japan can send goods cheaply to many parts of the world. She exports cotton and rayon cloth, machinery, ships, canned fish and fruit, and many things made in her factories.



The result of an earthquake in Japan

Earthquakes and storms

An earthquake is a shaking of the ground caused by violent movements far beneath the earth. Japan has more earthquakes than any other country. Almost every day, throughout the islands, there is a small earthquake somewhere. During these earth tremors, the houses shake, the earth trembles for perhaps half a minute, and often crockery is broken.

In 1923 the worst earthquake in Japan's history destroyed most of Tokyo and Yokohama, and both cities had to be rebuilt. Earthquakes often cause fires when the charcoal stoves and heating tubs are upset; every year thousands of houses are burnt down. In the cities there are tall towers with look-out platforms, so that warning can be given at the first sign of fire.

Earthquakes also bring about huge tidal waves, which flood the coastal villages, destroy houses and drown many people. Sometimes tidal waves are caused through severe storms, called "typhoons". Occasionally during the typhoon season (from the end of August to the beginning of October), a storm may be so violent that ships are sunk and crops ruined. The people who live on the coast have built walls along the shore to try to protect their homes from typhoons and tidal waves.

13. A TRAIN JOURNEY ACROSS EUROPE

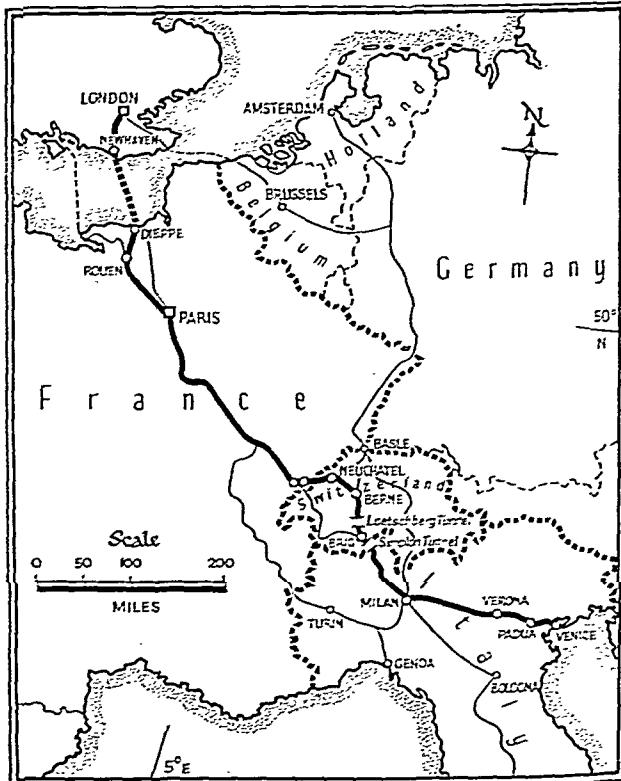
from London to Venice

From London to Paris

Mr. Taylor is a "buyer" for a London store. He is travelling by train from London to Venice, a journey which will take him through France, Switzerland and Italy.

He decides to cross to France from Newhaven to Dieppe. Here is the timetable of the journey as far as Berne.

How many miles is it to Paris, and how long will it take him to get there? (Remember that continental timetables use a "24-hour" clock.)



Mr. Taylor's route from London to Venice



The port of Dieppe. The large boat is a cross-Channel steamer

Time	LONDON—PARIS	Miles
8.50	dep. London (Victoria)	0
10.5	arr. Newhaven Harbour	56
10.45	dep. Newhaven	
15.0	arr. Dieppe Maritime	130
15.30	dep. Dieppe Maritime	
16.30	arr. Rouen	169
18.8	arr. Paris	235
Time	PARIS—BERNE	
8.10	dep. Paris*	0
13.0	arr. Frasne	274
13.26	arr. Pontarlier†	284
14.44	arr. Neuchâtel	317
15.46	arr. Berne	387

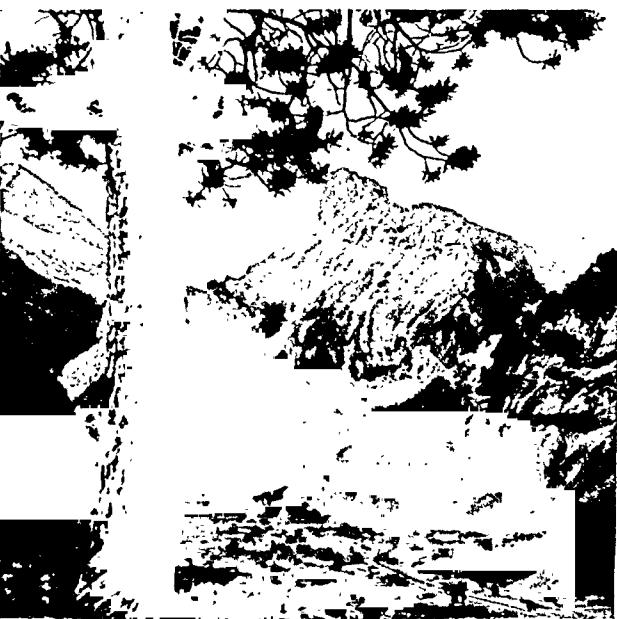
* Restaurant Car.

† Frontier station for customs, passport examination and exchange of money.

Mr. Taylor crosses the Channel on a British Railways steamer. The first part of his journey across France is through Normandy. The begins its orchards of cider apples, and they to the market gardens and dairy farmland. This farms of this fertile province, berland. provide much food for Paris.

After an hour in the train, meadows, Mr. Taylor sees the slate roofs of Rouen, an important industrial town on the banks of the River Seine. Rouen is also a busy seaport, since the Seine has been dredged to enable cargo boats to reach the city.

In this part of France there are many canals, linking the Seine and its tribu-



taries with many of the other rivers of France, including the Loire, the Meuse and the Rhône. Barges on the canals and rivers of France carry more freight than the railways. Some of the waterways link the north of France with Holland and Belgium.

Punctually at 6.8 p.m. the train arrives in Paris, where Mr. Taylor breaks his journey and spends the night. As he crosses the city by taxi on the way to his hotel, he sees brilliantly lit shop windows and busy cafés.



The refreshment trolley is taken down the train with drinks and food

From Paris to Berne

Next morning Mr. Taylor boards the train for Berne. It is a diesel train with a very good restaurant car. Mr. Taylor has breakfast as the train approaches the farming and vine growing provinces of Champagne and Burgundy, where two of the most famous French wines are made.

JOURNEY ACROSS EUROPE

from London to Venice

From London to Paris

Mr. Taylor is a "buyer" for a London store. He is travelling by train from London to Venice, a journey which will take him through France, Switzerland and Italy.

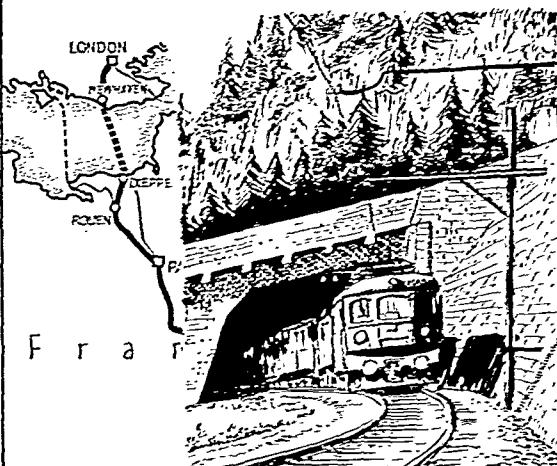
He decides to cross to France from Newhaven to Dieppe. Here is the timetable of the journey as far as Berne.

How many miles is it to Paris, and how long will and damp and there are heavy falls of snow. In the worst weather, the animals are kept in large barns which have ramps leading up to them.

At the frontier between France and Switzerland, customs officials come along the train, as it moves along, to examine the passengers' luggage and to stamp their passports.



These Swiss craftsmen are making watches by hand



For a

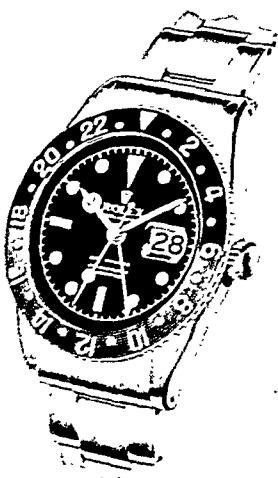
Scale
0 50 100
MILES

shelters are built over the line to from falling snow and rock

Then the train continues its long descent down the eastern side of the Jura mountains from the Swiss frontier. Here there are many rivers flowing towards the lakes of Geneva and Neuchâtel. The railway goes through tunnels and cuttings in the rock, and as the train enters each tunnel the engine driver blows a horn.

The people of the Swiss valleys of the Jura mountains are famous for the manufacture of things which need skilled and accurate workmanship : watches, clocks, cameras and microscopes.

This Swiss watch shows the date, and the time in two different zones of the world



From Berne to Milan

Beyond Berne the train goes through some of the finest mountain scenery in Switzerland. It runs alongside the Lake of Thun, and then begins its climb up the Kander valley to the winter sports town of Kandersteg. This part is called the Bernese Oberland.

Many Jersey cows graze in the rich meadows, but above the meadows, where the mountains are higher and steeper and the soil is poor, there is often nothing but rock and pine trees. Some of the little towns have factories where the pine wood is made into matches.

In the Kander valley, as in hundreds of other mountain valleys all over Switzerland, many people work at dairy farms and factories, making cheese, condensed milk and butter.

Twice a day, in the early morning and evening, the farmers who live on



The winter sports centre of Kandersteg



Weighing the milk at the cheese factory



Rubbing a cheese with brine to flavour and preserve it

the mountain slopes send their milk to the cheese factory in the valley. Sometimes children bring the churns down the mountain tracks in little two-wheeled carts pulled by huge dogs.

In the early summer, the cows are driven to the upland pastures where they remain until the autumn. The lower meadows are then sown with grass and clover, which is later cut and stored ready for winter fodder when the ground is covered with snow.

On the upland pastures there are little huts built of stone, with roofs of wooden shingles. Some of the people live in these huts during the summer months. They milk the cows and make cheese.

In the past, when the cows were on the upland slopes, the villages in the valleys were often short of milk. Today,



During the summer the cattle live on the high mountain pastures

in some parts of Switzerland, a new idea has been introduced from Austria. Polythene pipelines are buried, about two feet under the soil, so that milk can be sent down the mountain to a collecting "station" in the valley.



The train goes along the mountain sides to the valley of the River Rhône

The train crosses the Bernese Alps by the Lotschberg Tunnel, and then winds down the slopes of the mountain to the valley of the Rhône, the largest valley in Switzerland. This valley, which is protected by the Bernese Alps on one side, and the Pennine Alps on the other, is an important area for growing fruit and tomatoes. Not an inch of its fertile soil is wasted.

In the Rhône valley, as in many of the valleys of Switzerland, there are huge hydro-electric stations. Pipelines down the mountain sides carry the water from the mountain lakes to the generating stations in the valleys. The lower slopes of the mountains, and the spaces between the fruit trees, are planted with grape vines. Some varieties of grapes are for eating; others are made into wine.

Before the train reaches the frontier town of Brigue, a money changer comes along the train, and Mr. Taylor changes his French and Swiss *francs* into Italian *lire*.

At Brigue, the train enters the Simplon Tunnel. This tunnel, $12\frac{1}{2}$ miles long, took seven years to build. The frontier between Switzerland and Italy is in the tunnel.

At the town of Domodossola over the frontier the Swiss engine is changed



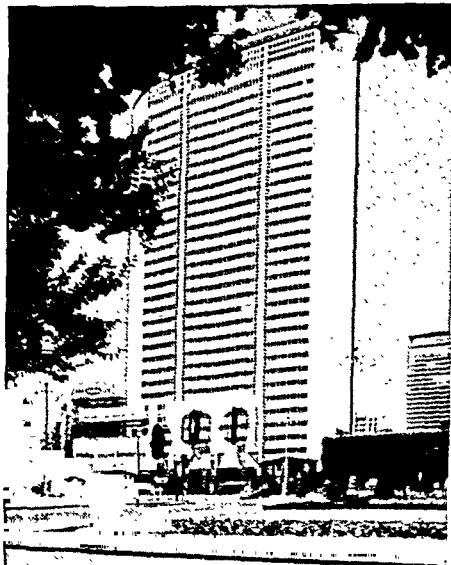
A money changer comes along the train

for an Italian engine. Two hours later the train reaches Milan, the most important industrial city of North Italy.

Milan

As Mr. Taylor comes out of the vast station he sees wonderful new shops and office blocks. Italy is famous for good design, in buildings, clothes, furniture, cars and machinery.

Mr. Taylor spends several days in Milan. He visits the Pirelli factory to place orders for sports-shoes and foam-rubber mattresses. Tyres and many other kinds of rubber and plastic articles are also made there. Mr. Taylor later visits a silk factory and orders silk scarves for his store. Italian silk-fabrics have been famous for centuries, although today, now that so many "man-made" fabrics such as nylon are being worn, only about one mill in ten produces pure silk.



A new office block in Milan

In Northern Italy there are many factories making cars, cycles and motor-scooters. On a track near Milan, racing cars from many European countries compete against Italy's Ferrari and Maserati cars. Alfa Romeo cars are made in Milan; Ferrari and Maserati cars are made in Modena.

After leaving Milan, Mr. Taylor travels on by train eastwards across the broad Plain of Lombardy. In many parts of Italy, farming is difficult because of the shortage of water. The Plain of Lombardy, however, has plenty of water. The River Po crosses the plain from west to east; tributaries from the Alps in the north, and from the Apennine mountains in the south, flow across the plain to join the main river.

Two of the most important crops grown on the Lombardy Plain are rice and maize. Instead of hedges, rows of mulberry bushes, or grape vines trained over low wooden frameworks, divide

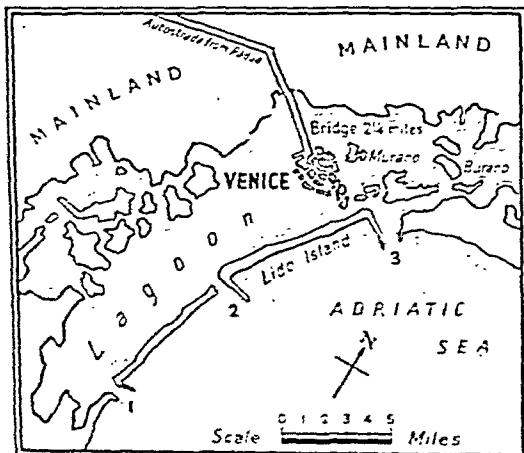


A farmhouse on the Lombardy Plain. The farmer is hanging up maize cobs to dry

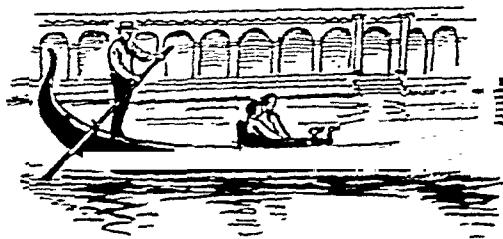
the fields. In autumn, the farmers and their families harvest the tall maize plants, storing the stalks in barns for use as bedding for the cattle. The bright orange maize cobs are dried on the farmyard floor, or under the eaves and balconies. Later they are ground into flour.

Venice

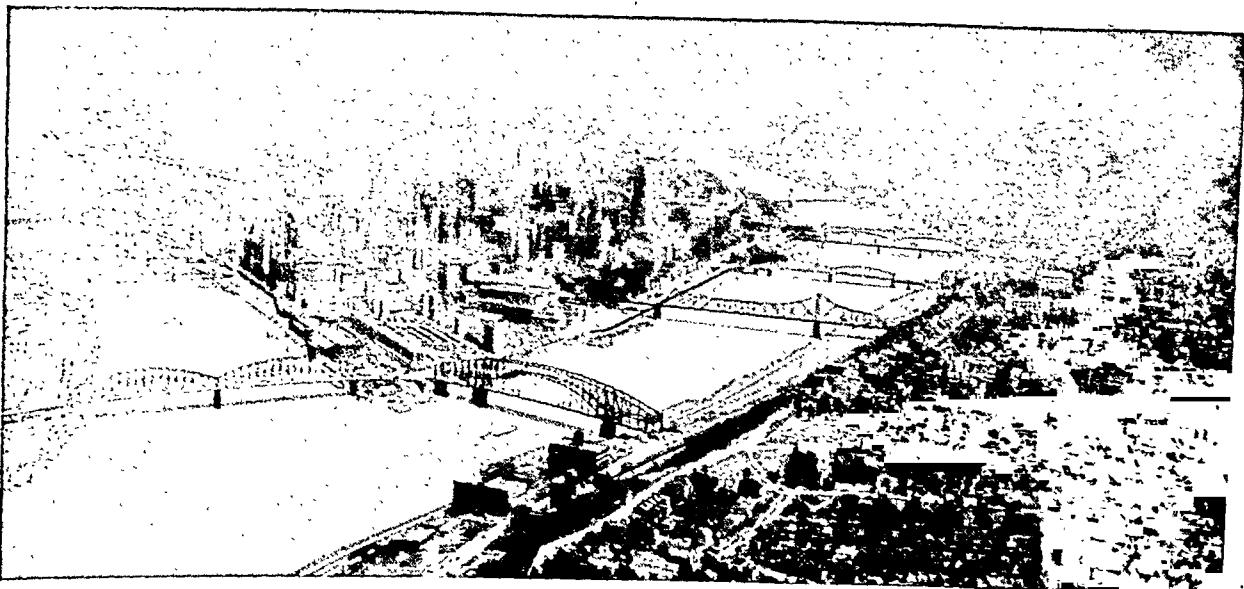
At last the train reaches Venice, one of the most unusual cities in the world, for it is built on over a hundred islands in the middle of a lagoon. The houses are built on wooden piles driven into the mud, and the islands are linked by bridges across the canals.



Venice is built on over a hundred islands. The railway line and road are carried over the lagoon by a bridge 2½ miles long



A Venetian gondola



Most of the people who work in Pittsburgh live in the suburbs, on the heights around the city

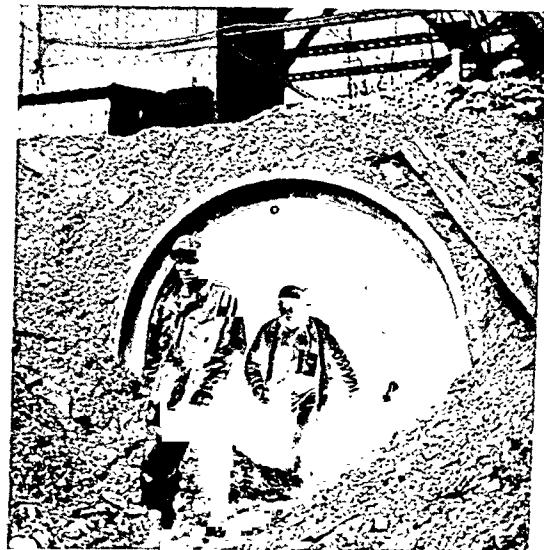
Pittsburgh

The picture above shows the great steel-making city of Pittsburgh. This huge city is criss-crossed by a maze of railways, roads and canals which carry iron ore, coal and limestone to the steel mills, and finished steel from the mills to other parts of the U.S.A. Pittsburgh is one of the biggest cities in the industrial north-east. It produces one-fifth of America's steel.

The iron ore from which the steel is made is quarried to the south and west of Lake Superior, and loaded into railway wagons which carry it to ports on the Great Lakes. Barges take the ore to Chicago, Detroit and Cleveland.

The coal comes from the Allegheny coalfield, around Pittsburgh. Iron ore can be carried more cheaply than coal, so the steel industry has grown up on the coalfield. Allegheny coal is easy to mine, because the seams are thick and level, and because river valleys have cut through the coal seams. Miners there

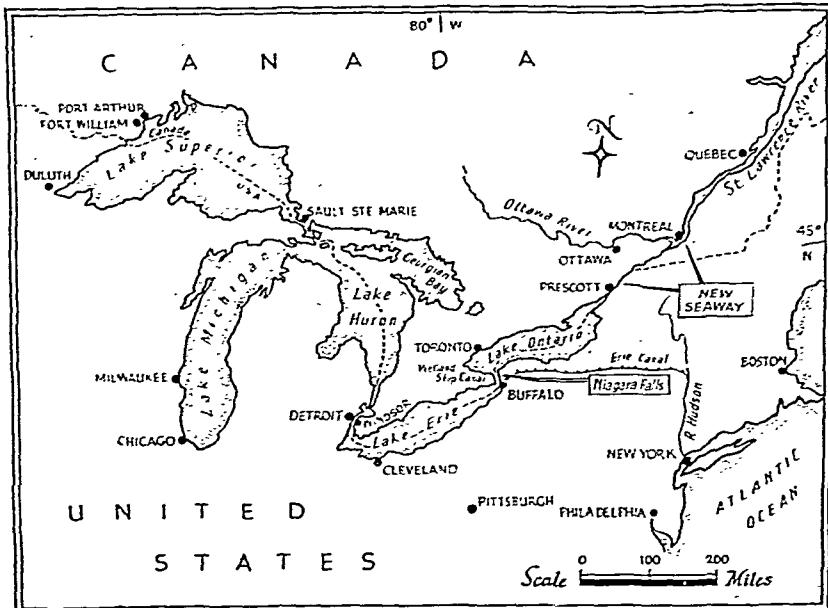
have only to tunnel into the valley sides to reach the coal, instead of having to dig deep pits, as is usually necessary in Britain. The coal is good coking coal for steel making.



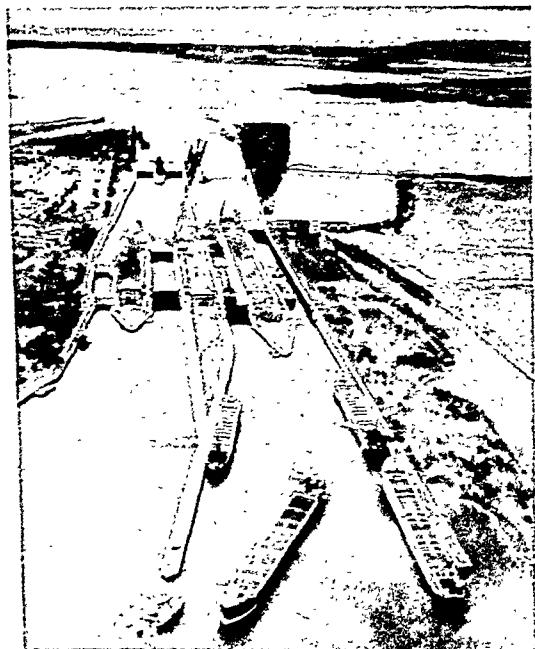
Miners leaving a drift mine in Pennsylvania. Many of the miners are descendants of the Irish, Welsh and Slavs who emigrated in the nineteenth century

The Great Lakes and the St. Lawrence Seaway

There are many important ports on the Great Lakes. From these ports ships carry wheat, iron ore, steel, and many other cargoes, taking them to other ports in Canada and the U.S.A., and to countries overseas.

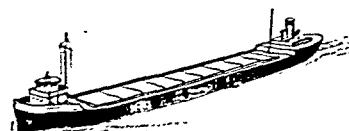


The Great Lakes and the St. Lawrence Seaway

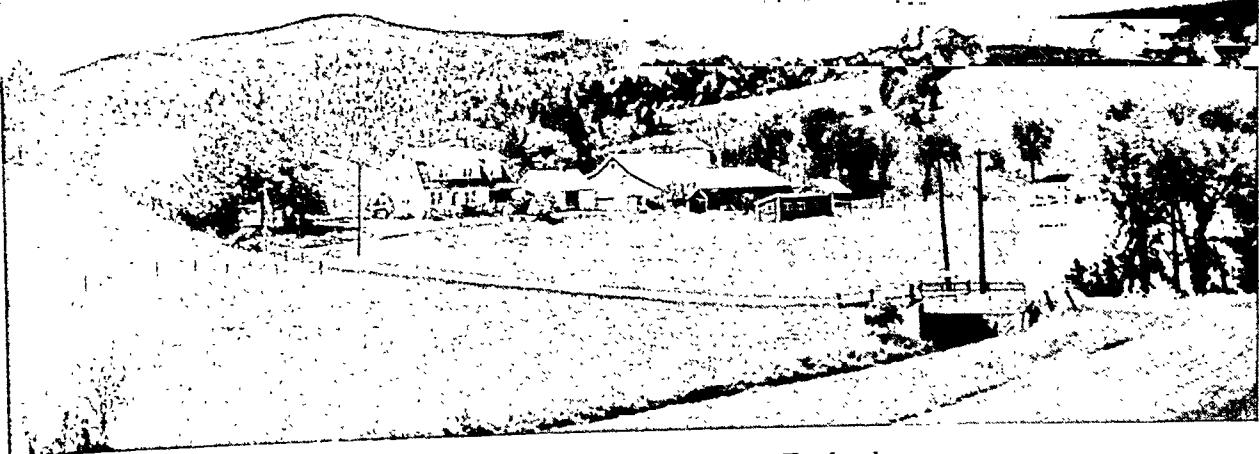


The locks at Sault Ste. Marie

Until recently, large sea-going ships could not sail all the way up the St. Lawrence River to the Great Lakes because of rapids in the river. But in 1959 the St. Lawrence Seaway was opened. This is a series of canals between Montreal and Lake Ontario which by-pass the rapids. To make the seaway, new canals were dug, old canals were deepened and widened, bridges were raised, and locks were made. Large ships can now sail all the way to Chicago and Duluth—but only for eight months of the year. During the four months of winter the lakes are frozen over.



A Great Lakes iron-ore carrier. The ship is divided into several compartments



A small farm in Vermont, New England

New England

The states north of New York are called New England, because many Englishmen were amongst the first settlers there. Vast forests of coniferous trees grow on the mountain sides ; in

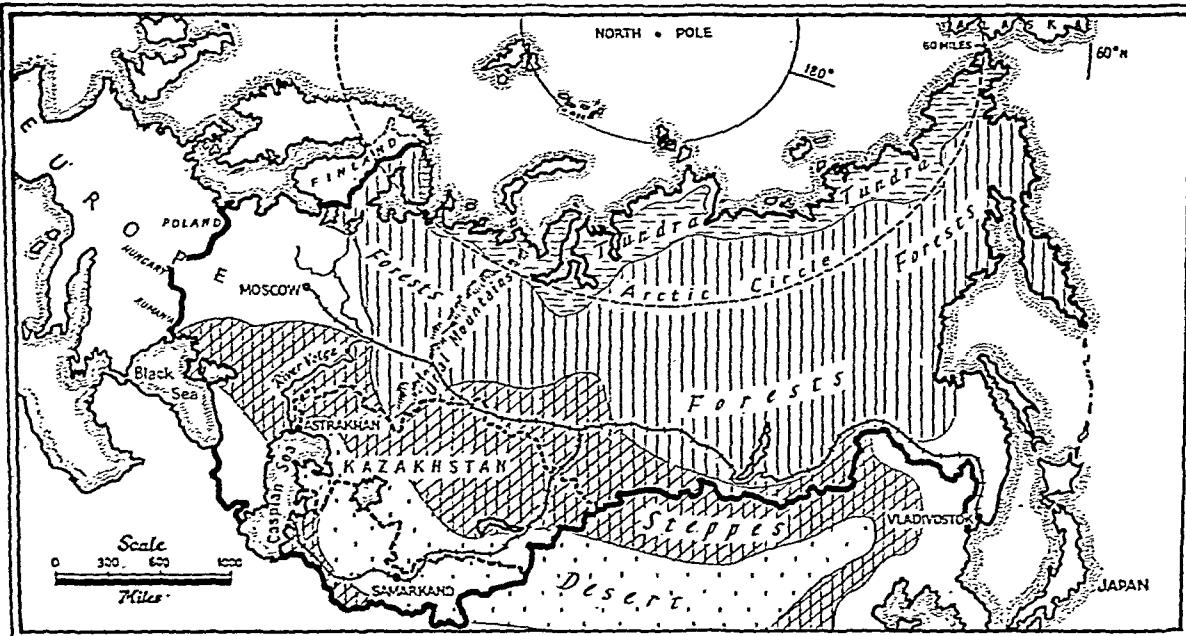
the lowlands, by the coast, farming is difficult because the soil is poor and stony and the winters are very long and cold. The farms produce food for the industrial towns to the south : potatoes, fruit, milk, butter and cheese. Many farmers work only part-time on the land ; they also work at lumbering in the forests, and they fish for cod, herring, and lobsters in the sea, and for trout and salmon in the rivers.



Cutting down a tree with a power-driven saw

Timber from the forests is made into furniture and paper at factories in New England. Most other factories there have to import their raw materials : they make cotton, woollen and linen cloth, shoes, and metal goods. Ships are built in Boston, the port for New England.

Many Americans visit New England for their holiday. In summer they ramble through the forests and hills ; in winter they ski on the mountain slopes.



The bold black line shows the border of the Soviet Union

15. RUSSIA

Russia, the largest country in the world, stretches from Eastern Europe right across Asia to the borders of China. The correct name of this vast country is the U.S.S.R., or Union of Soviet Socialist Republics. Russia is really the name of the largest and most important of the fifteen republics, each of which has its own capital, but in this chapter "Russia" means the Soviet Union. Moscow is the capital of the republic of Russia and of the U.S.S.R.

During the last forty years Russia has changed from a backward country with few factories into one of the greatest industrial nations in the world. The country is rich in natural resources: there are plentiful supplies of water power for making hydro-electricity, uranium for making atomic power, oil, coal, iron ore and other minerals.

Wool, cotton, grain and timber are produced in great quantity.

Many young Russians have been trained as engineers and scientists, and as a result the Russians are able to build fine tractors, lorries and trains, aeroplanes which can fly non-stop from Moscow to New York, and rockets which can travel in outer space.

The largest country in the world

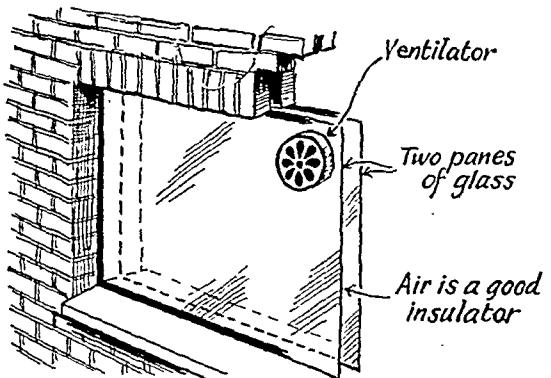
Russia is so vast, that some of the western cities are as far from those in the east, as Cape Town is from London. In order that people may travel to the other side of their country, a great railway has been built, with many branch lines. The main line of this railway runs from Moscow in the west to the port of Vladivostok in the east, a distance of over 4,000 miles. The

passengers eat and sleep on the train, and the journey takes ten days.

Because of the huge size of Russia, there are great differences in climate between various parts. Much of Russia is far from the sea, and many places have long cold winters. In Moscow, the temperature in January is only 12° F. (20° below freezing point). In the Black Sea area, at Yalta, the January temperature is 38° F., and the summers are hot and dry. This part is sometimes called the Russian Riviera.

A family in Moscow

Boris and Olga Beglov, with their children Katya and Sasha, live in a new block of flats in the centre of Moscow. The rooms have double glass windows, one in front of the other, to keep out the cold, and in the winter the flat is centrally heated. If any room becomes overheated, the ventilators in the windows are opened for a few minutes to cool the air.



Double windows keep out the cold

When the Beglov family go out-of-doors in winter, they wear thick clothing to keep themselves warm. Every morning, gangs of men and women armed with crowbars break the ice from the pavements, and mechanical grabs tip the snow down manholes into the city's underground streams. After a heavy snowfall, special scrapers, each joined to a moving belt, are brought into the streets. The snow is scooped on to these belts, and taken away by fleets of lorries.



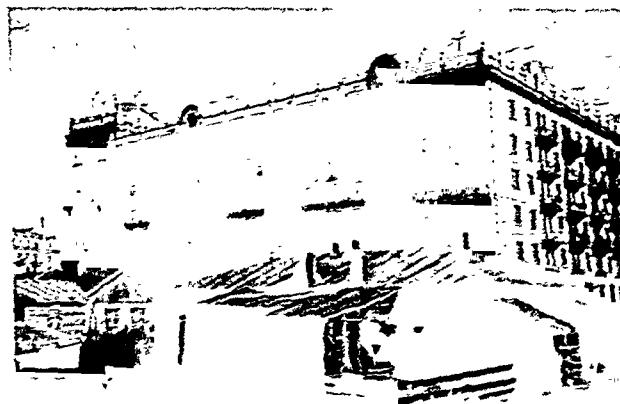
Winter in Moscow. The mechanical grab is tipping snow down a manhole into an underground stream

On a winter's day the sky is often bright and cloudless, and the air is clean and dry. The city is lit and heated mainly by electricity or natural gas. (Natural gas is found gushing out of rocks, usually where there are oilfields. Most of Moscow's gas supply is brought over 800 miles by pipelines). The only smoke in the city is from an occasional power station ; there are no coal fires, and steam trains do not come into the city.

Work and play

Like most Russian women, Mrs. Beglov has a full-time job. She works in a motor-car factory where her husband is a foreman. The factory is owned by the state, as are all the factories, mines, forests, banks and railways in Russia.

The Beglovs travel to work on the underground railway. Moscow's underground stations are almost like palaces. Many of them are built of white marble brought from the Ural mountains. Each station is different ; the walls are



Like most cities, Moscow has a mixture of old and new houses and flats



Most Russian schoolboys wear a dark blue uniform with a cap

decorated with paintings and marble statues, and magnificent chandeliers hang from the roofs.

As nearly everyone works all day on Saturday, Sunday is the main holiday of the week. Cafés and stores are open, and the ballet, the puppet theatre and the circus are always crowded.



A woman traffic director, with baton and whistle



A village school



Sunflowers have huge heads, with many seeds. Oil from the seeds is used for cooking. The residue is used to make cattle cake

School for the younger children finishes in May, and does not start again until the autumn. During the summer, while their parents are working, Katya and Sasha live at a camp for the children of motor-car workers.

Farming in Russia

If you look at the map on page 324, you will see that in the far north of Russia are the frozen lands of the *tundra*, and to the south of the tundra are the great coniferous forests. South of the forests there are grassy plains called *steppes*. Much of this grassland is rich farming country, where grain is grown and big herds of dairy cattle are reared.

All land in Russia belongs to the state, and the people work for the state instead of having farms of their own. Most of the small farms in each district have been joined together to make large farms, known as "collectives". The collective farm is really a village with

the old boundary hedges removed and with its own school, library and hospital.

Ploughing, planting and harvesting must be done in the five spring and summer months—from May (when the snow melts), to the end of September. As most of the farms are large, a great deal of machinery is used.

Harvest is the busiest time on the collective farm. Fields of ripening wheat stretch endlessly into the distance, and on the poorer soil rye and barley are cultivated. Everywhere there are patches of sunflowers, whose stalks, with their huge flower heads, grow taller than the harvesters.

The whole village helps during the harvest; even the children and old people. The workers have their midday meal in the communal dining room, or hot dinners are taken to them in the fields by a travelling kitchen.

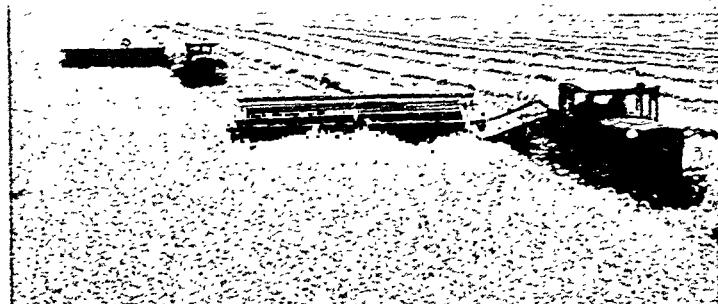
After the harvest, the government buys the crops, using some of the profits to buy new farm machinery. The rest of the money is shared between the farmers, everyone being paid according to the number of days he has worked and how well he has worked. Each year there are prizes for the best workers: the prize may be a week in Moscow or a free winter holiday by the Black Sea.

Most of the workers have a little land of their own, and they may do what they like with the fruit and vegetables which they grow. Sometimes, on his free day, a farm worker takes a farm cart to the nearest railway station where he sells his surplus produce to the passengers on the trains from Moscow to Vladivostok.

In the country the workers buy very little food, as nearly all the food they need is produced in their gardens or on the farm. They are given meat, eggs and milk as part of their wages. Their tea is sweetened with honey from the farm's beehives, and their "black bread" is made from rye grown in the fields. (Rye bread is not really black, but is more like a coarse, brown, whole-meal bread.)



A Cossack.

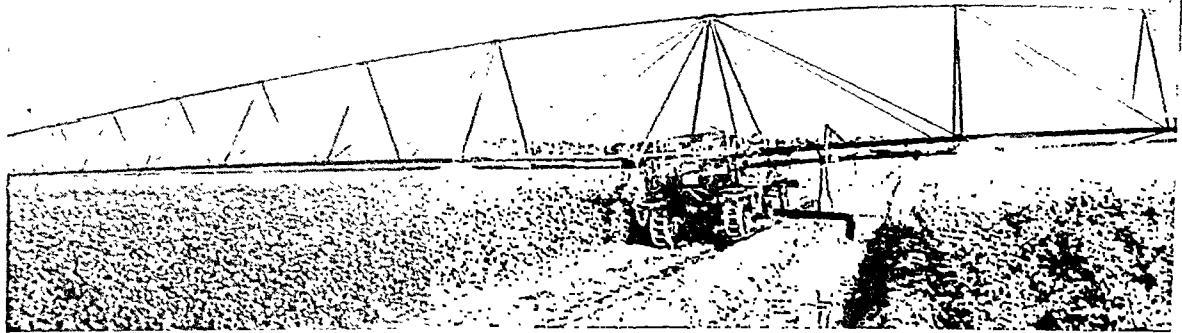


Harvesting grain on the steppes

During the long winter months, when the ground is covered over with snow, there are no fresh vegetables. Instead, the people eat bottled tomatoes, cabbages which have been shredded and preserved between layers of salt, and short, fat cucumbers called gherkins, pickled in jars of salt water.

The dry steppelands

Farther south, in the Soviet republic of Kazakhstan, the steppes are too dry for growing crops. Instead, the people keep flocks of sheep and breed horses and two-humped camels. (The camels are used for transport in the deserts which lie to the south.) Kazakhstan, which means "the land of the Cossacks", is the home of some of the world's finest horsemen. In the past, the people of these dry steppelands were *nomads*, moving from place to place to find fresh pasture for their herds. Nowadays the Kazakhs are being gathered on to collective stock-raising farms.



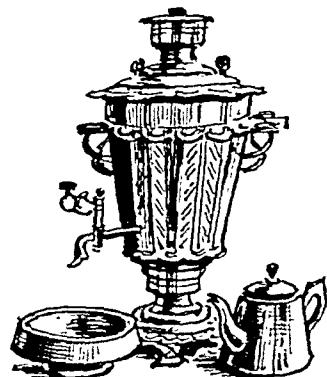
Growing cotton on dry land. The plants are watered by "artificial rain" from the ditch

The desert lands

The hot, dry Soviet Republics of Central Asia stretch from the eastern shore of the Caspian Sea to the borders of Persia and Afghanistan. Here, as well as great deserts, there are high mountain ranges, whose snows for centuries have provided the people with water to irrigate the land. Nowadays, more water is needed, and by changing the course of the rivers, Russian engineers are building a network of pipelines and irrigation canals. As soon as water has made the barren soil fertile, new vineyards, apricot orchards and cotton fields are planted.

The people of these dry lands are Mohammedans, and for centuries the cities which have grown up round their oases have been important trading centres. The most famous of these eastern cities is Samarkand, where Chinese traders once brought caravans of camels and donkeys laden with the spices, pearls and silks of the East.

Nowadays, a railway line joins the cities, and jet planes fly over the old caravan routes.



Most Russian households have a samovar, which is heated by charcoal or electricity and holds hot water for tea making

A central Asian family. This part of Russia is famous for its woven carpets

16. Some Countries of SOUTH AMERICA

From north to south, the continent of South America is nearly 5,000 miles in length. In this great distance there are many different kinds of climate and vegetation, as you can see from the map.

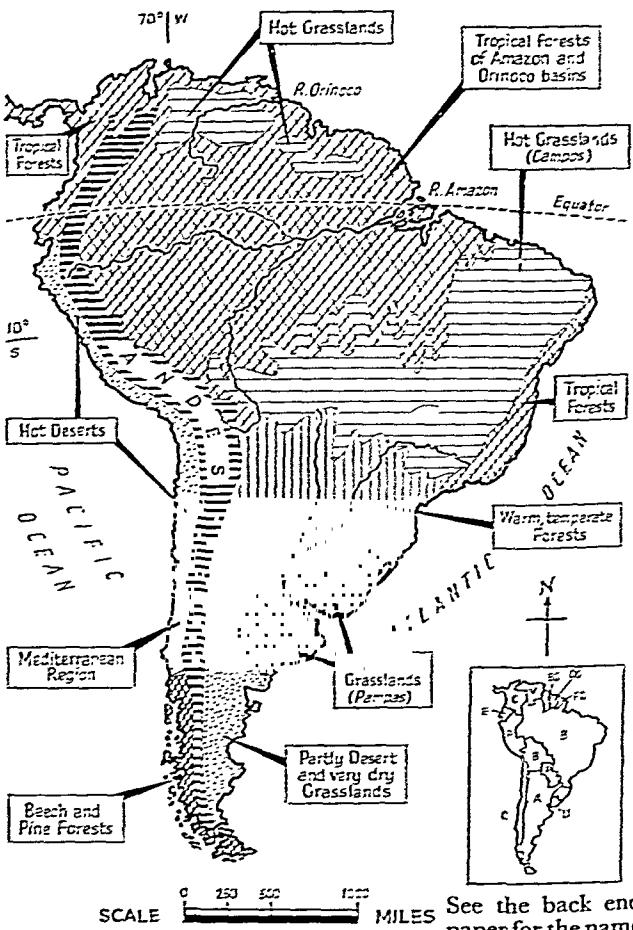
Round the equator, where there is heavy rain on most days of the year, are the hot steaming forests of the Amazon.

In Brazil, Uruguay and Argentina are hundreds of miles of grassy plains. These grasslands grow wheat, and also provide food for large herds of cattle.

The southern part of the continent is much cooler than the north, because it is farther from the equator. Throughout the year, westerly rain-carrying winds blow across the Pacific Ocean, but the *Andes* mountains keep off the rain from southern Argentina. This means that southern Argentina, called Patagonia, has a dry, almost desert climate, in which little grows except shrubs and coarse grasses. It is too dry for cattle, but in some parts sheep are kept.



Parting the coat of a Patagonian sheep to show its thick, rich wool



See the back end paper for the names of the countries

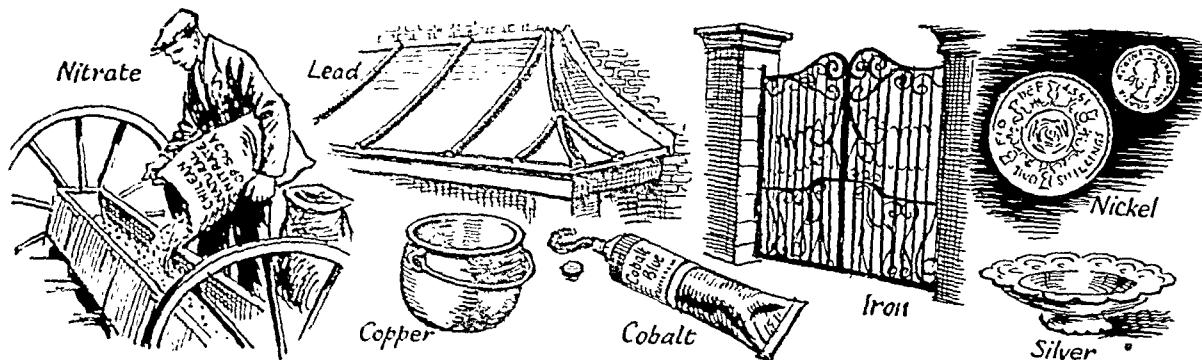
CHILE

Southern Chile

On the *western* side of the *Andes*, stretching from the tropics to Cape Horn, is the long, narrow country of Chile. Southern Chile has a cold, damp climate with a heavy rainfall brought by the westerly winds. Here, the coastline is cut into steep-sided fiords covered with forests.

Central Chile

Travelling northwards through Chile, the climate gradually becomes warmer and the forests disappear. Central Chile, which has a climate like that of



Some of the many uses of the minerals mined in Chile

the Mediterranean lands (warm, wet winters and hot, dry summers), is the most fertile part of the country. The hot summers ripen fruits such as oranges, lemons, apricots and melons. Wine made from Chilean grapes is exported to Europe and the United States.

Northern Chile

To the north of this fertile land is the waterless, sunbaked, Atacama Desert of northern Chile. Nitrate, which is used by farmers as an artificial manure, is

obtained from rocks in the desert. It is Chile's most important export.

When the nitrate leaves the factory, as a white powder, it is taken by rail to Antofagasta and other ports on the nitrate coast. Ships sail from these ports to all parts of the world, loaded with nitrate, copper and cargoes of tin from the mines of Bolivia. (Bolivia has no coastline of her own.)



Nitrate mining. Gunpowder is poured into drill holes and then exploded to loosen the surface rock of the desert

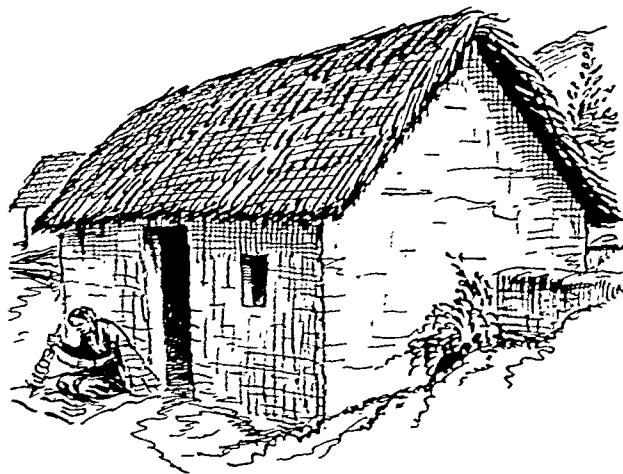
Nothing will grow in the Atacama Desert, so fruit and vegetables for the miners are flown from Central Chile to the ports on the coast, and water is brought by pipelines from the Andes. The water for Antofagasta is piped for nearly 200 miles.

Over the Andes

The Andes (which, after the Himalayas, is the world's highest mountain range) stretches from north to south through the countries on the western side of South America. Even at the equator the peaks are so high that they are always covered with snow.



A herd of llamas in the Andes



An Indian house. The woman is spinning llama wool

The Andes is not a single range of mountains, but a number of ranges with plateaus (plains) between. There are few roads and railways in the high Andes, and it is difficult and costly to build them.

The railway from the sea coast of Chile to La Paz, the largest city in Bolivia, climbs to a height of 15,000 ft. (over three times as high as Ben Nevis, the highest peak in Britain).

The Indians of the high plateau

Much of the plateau country is sandy, stony desert or poor grassland. The Indians breed sheep, and look after flocks of goats, llamas and alpacas. Both the llama and the alpaca are members of the camel family. The llama provides milk and can carry loads of over a hundred pounds. The alpaca is reared for its long, silky wool.

Many of the towns on the plateau have been built where minerals are



Indian boats on Lake Titicaca. As the lake is above the height at which trees will grow, the boats are made of rushes

mined. Railways link the mines with towns on the Pacific coast. Visitors to the plateau find it very difficult to breathe because of the shortage of oxygen in the air, for the higher one goes the "thinner" is the air. But the Indians who work in the mines have larger lungs than Europeans, and as they are used to the "thin" atmosphere, they can work hard without strain.

An Indian house, built of sun-dried mud bricks, often has only one room. As the house is unheated it has solid walls, with only one small window. The floors are made of beaten earth, and the roof of grass or barley straw.

The Indian women spin sheep's wool or the coarser llama wool, and weave it into blankets and clothing. Some of their textiles are very beautiful, and many Indians still wear their traditional dress, even though market stalls in the towns sell ready-made clothing in American styles.

ARGENTINA

The original inhabitants of South America were the American Indians. Then, in the sixteenth and later centuries, people came from other countries, mostly from Europe, and particularly from Spain, Portugal and Italy. Today in South America, Indians and the descendants of Europeans are mixed throughout the land. But in Argentina there are hardly any Indians, and nearly all the people are descended from Europeans. From the grassy plains called the *pampas*, they have made a wealthy country where they rear cattle and grow wheat.

The pampas were not very useful until five things happened :

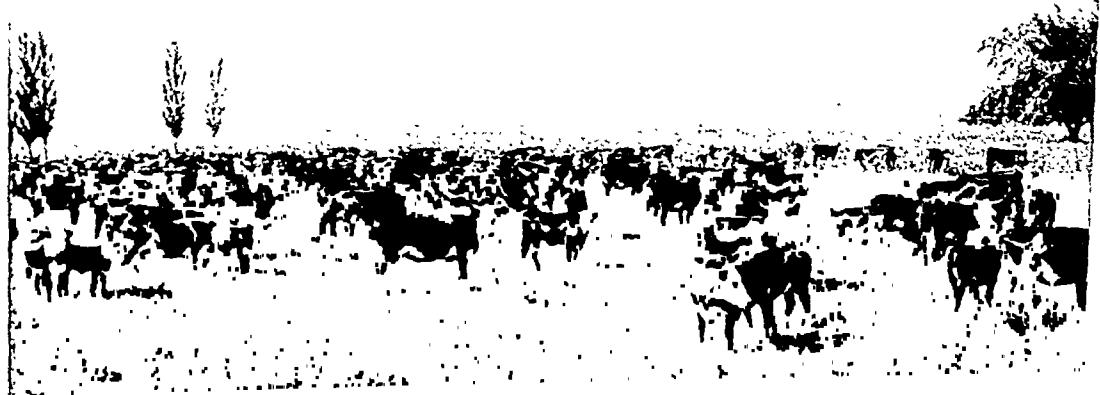
1. *Good cattle* were brought from Europe.
2. *People* came from Europe to work the land and look after the cattle.
3. *Wire fences* were put up to prevent the cattle from straying.
4. *Railways* were built to carry the cattle and grain to the ports. (It was easy to build railways on the level land of the pampas.)



Beef carcasses hanging in a refrigeration plant before being shipped to other countries

5. *Refrigeration* was invented, which meant that meat could be kept fresh on the long sea voyage to other countries.

Buenos Aires is the largest city in Argentina, and the ninth largest city in the world. Argentina imports steel goods, machinery, fuel oil and textiles, and pays for them by selling her meat, hides, wool and wheat.



Hereford cattle, originally imported from England, grazing on the pampas

17. NEW ZEALAND

The Maoris

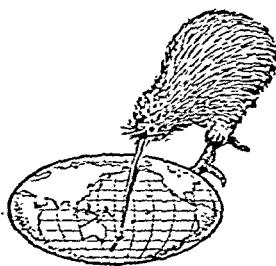
A Dutch navigator called Tasman discovered the islands of New Zealand, naming them New Zealand after the Dutch province of Zeeland. Later, Captain Cook explored the coasts and sailed through the 10-mile-wide strait dividing the North and South Islands.

Cook found an intelligent, brown-skinned people called *Maoris* living in New Zealand. About four hundred years earlier these people had travelled southwards from the Pacific Islands in search of a new home. As they were used to the heat of the tropics they settled mainly in the North Island, which is nearer to the equator, and is the warmer of the two islands.

The Maoris lived in fortified villages called *pas*, and gave the settlements names in their own language, like Wanganui (great harbour). In his journal Cook describes their customs, their wonderfully carved houses, and their clothes made from flax.

Settlers from Britain

Apart from small settlements of traders and sealers, it was not until 1840, just over sixty years after Cook's last visit, that people from Britain began to emigrate to New Zealand. They named



The kiwi is a bird found only in New Zealand. It has very tiny wings and cannot fly, but it can run very quickly



Maori children in a hut decorated with Maori carvings

their settlements after British towns—such as Canterbury, Cambridge, Hastings and Stratford.

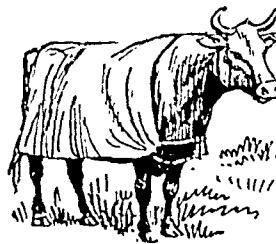
Today there are fourteen times more Europeans than Maoris, and most Maoris speak both their own language and English. The Dominion has no "colour bar", and a Maori can marry a European. There are Maori Members of Parliament, lawyers, and doctors—in fact, the Maoris have equal rights with the white New Zealanders.

New Zealand needs more British immigrants. The Dominion is nearly as big as the British Isles, and yet in Greater London alone there are four times as many people as there are in the whole of New Zealand.

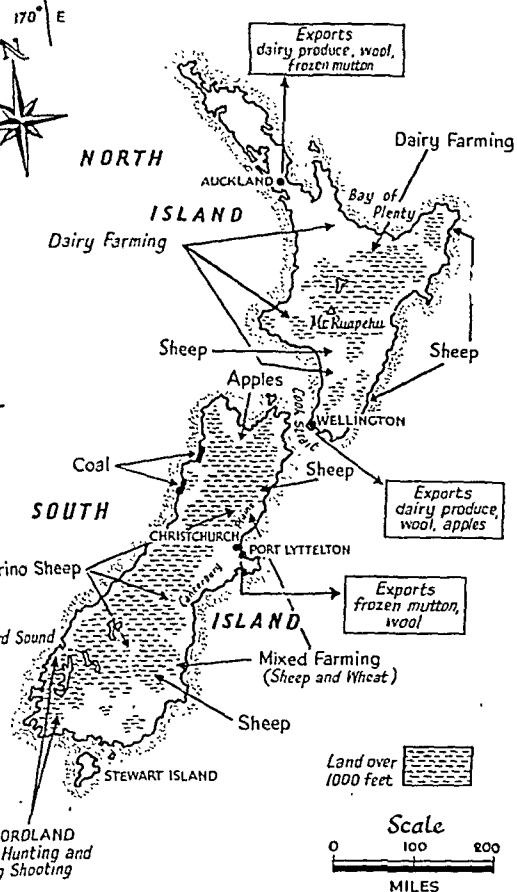
The country which the settlers found was very varied. The South Island has a high ridge of mountains called the Southern Alps running down the west side. The North Island has mountains in the centre. Nearly all the British immigrants took up farming, settling first on the plains near the coast.

North Island

Most of the country's dairy farms are on the coastal plains of the North Island. Here, as rain falls throughout the year, there is always good grassland, and many Jersey cattle are kept. The winter is warm enough for the cattle to be turned out to pasture, and so a New Zealand dairy farm does not need cow-sheds. In some places, where the winters are cooler, the cattle wear canvas covers for the winter months.



A cow wearing its winter cover



Mount Egmont, North Island

Most farmers use milking machines which are driven by hydro-electric power brought to the farm by overhead wires. The dairy produce of the North Island is exported from the seaports of Auckland and Wellington.

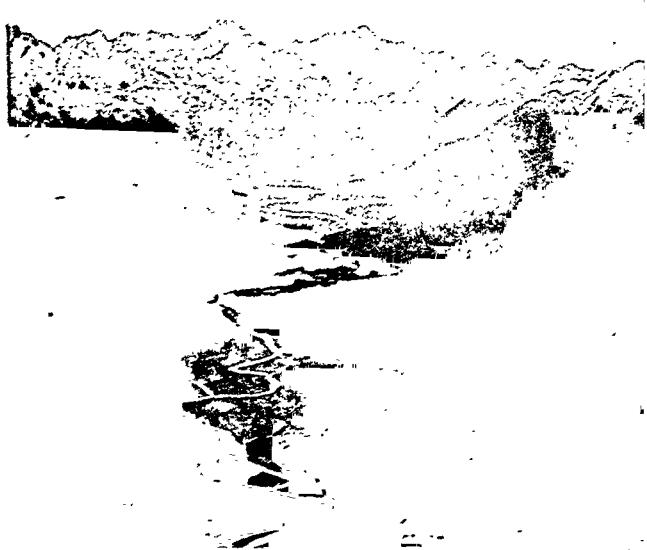


Sheep droving at Te Reinga, South Island

South Island

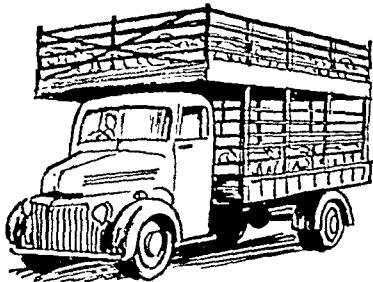
The main winds in the South Island are rain-bearing westerly winds, and the west and south-west coasts have a very heavy rainfall. When these winds reach the mountain barrier of the Southern Alps, the water contained in them falls as rain.

On the mountain slopes on the opposite side of the Southern Alps, and on the Canterbury Plains which lie at their feet, it is much drier, because the winds have lost most of their moisture. The Canterbury Plains, in the "rain-shadow" of the Southern Alps, are famous as a sheep farming area. The farmers also grow wheat, oats and potatoes, as well as fodder crops such as grass and turnips for their sheep.



Eglinton Valley, South Island. Notice the "tree line", above which trees cannot grow

The sheep are sheared at the beginning of summer, which in New Zealand is round about Christmas time. In January the roads across the plains are busy with trucks laden with bales of wool, and with double-tiered lorries taking the sheep to the freezing works. After the sheep have been killed and the carcases frozen, they are exported from Lyttelton in ships with refrigerated holds. (Lyttelton is the port for Christchurch, the chief city of the Canterbury Plains from which we get the famous Canterbury Lamb.)



Sheep are carried in double-tiered lorries

New Zealand's Industries

Most of the industries are connected with agriculture or with making things needed by the people. Many articles needed for the manufacturing industries have to be imported from Britain: cloth, buttons and thread for the clothing industry, and car parts for the motor assembly plants.

SOME INDUSTRIES CONNECTED WITH AGRICULTURE

Meat freezing
Butter and cheese making
Ham and bacon curing
Jam making
Fruit preserving
Hide tanning
Flour milling
Saw milling

L.W.—23

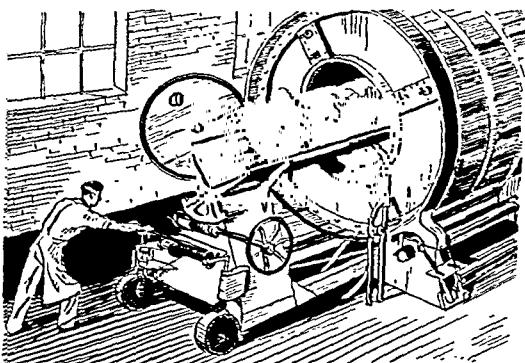
SOME INDUSTRIES FOR THE NEW ZEALAND MARKET

Clothing
Motor-car assembly
Radios
Electrical goods
Agricultural machinery
Boots, shoes, saddles
Biscuits
Furniture, printing



The Karapiro Dam provides hydro-electricity for the factories of North Island

New Zealand, unlike Britain, has very little coal and so has few industries. Instead of coal, hydro-electricity provides power for the factories.



Taking a trolley load of butter from a churn

The country is fairly prosperous because there is so much agricultural produce to export. The shops stay open until 9 p.m. on Friday evening instead of opening on Saturday. At the weekends, banks, offices, garages and shops are closed. New Zealanders spend much of their leisure out-of-doors ; they ski, walk and climb in the mountains of the North and South Islands, fish for trout in the streams, and camp beside the many lakes.

The Southern Alps

A great deal of the South Island is filled by the mountain range of the Southern Alps, with its high peaks which are snow-covered all the year. (The highest is Mt. Cook, 12,349 ft.) Sir Edmund Hillary, the New Zealand polar explorer and climber of Everest, did much of his training on the snow-fields and glaciers of the Southern Alps.

In winter there are very heavy falls of snow in the Southern Alps. During the summer only the top layer of snow melts, and the water sinks into the snow and freezes underneath the surface. In time a "river of ice", called a glacier, is made. Glaciers move very slowly down the valleys, never more than

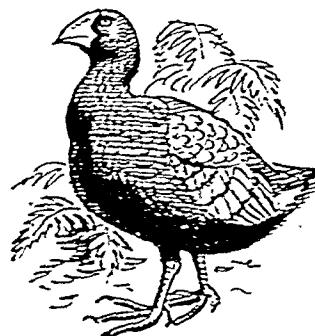


A deep crevasse in Fox Glacier, South Island

a few inches a day. Sometimes, as they move, the ice cracks, and huge *crevasses* are formed, many feet wide and deep.

Fiordland

The south-west corner of the South Island, with its mountains, lakes and ocean fiords, has some of the finest scenery in the world. The mountains, which rise steeply from the shores of the lakes and fiords, are covered with thick forests, and crossed by waterfalls and deep river gorges. Parts of the area have not yet been mapped or explored, and a few years ago birds called *notornis*, which the New Zealanders thought were extinct, were found in the forests of fiordland.



A notornis, which was thought to be extinct until naturalists found it again in the forests of fiordland

Some geysers throw up boiling mud instead of steam and water.

*Crater of geyser
Deposit of silica*

Water flowing through cracks in the rocks makes new channels which in time reach the surface and become geysers

Water in lower throat of geyser becomes so hot that it changes into steam. This steam forces the water above it into the air

Water meeting hot rocks in the interior of the earth has a temperature much greater than the surface boiling point



A section through a geyser

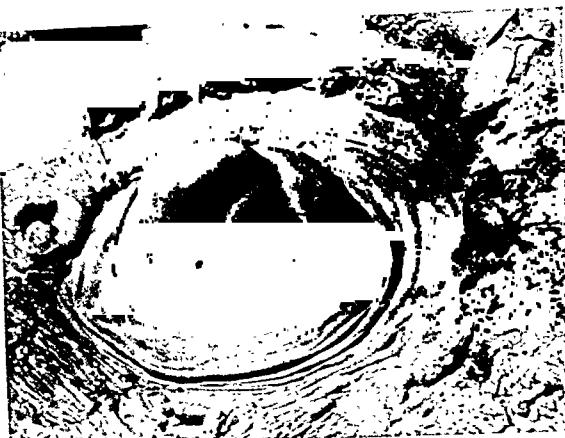
Geysers and hot springs

In the North Island some favourite "sights" are the geysers and hot springs of Rotorua. Here, because there is great heat below the earth's surface, hissing and rumbling can be heard under the ground. In places, there are streams and lakes of hot water, and steaming cliffs and waterfalls.

The Maoris of the hot springs district act as guides to the visitors. There are many "Keep to the Path" notices, for in places boiling fountains of steam and water (called geysers) explode high into the air. Everywhere, too, there are pools of creamy mud, which make a continual "plop-plop" noise as the mud bubbles and gurgles.



Maori guides welcome visitors to the geysers at Rotorua



Boiling mud at Rotorua

Let's Remember

THE TEMPERATE LANDS

(*Temperate* means "moderate" or "mild".)

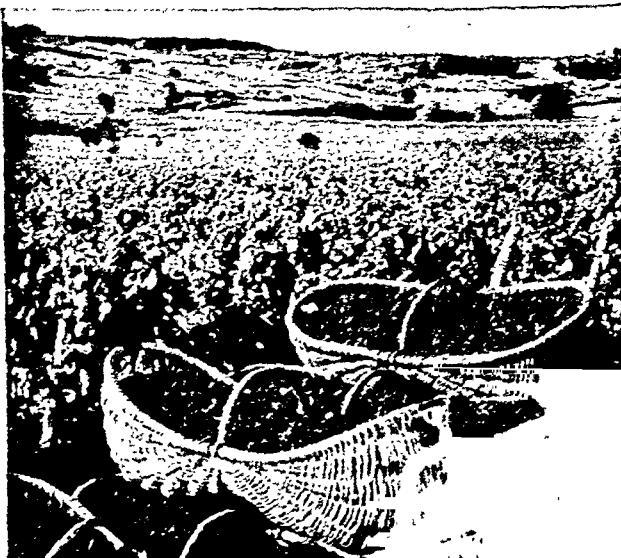
Remember that *distance from the equator*, the *height of the land*, and *distance from the sea*, all help to decide the climate of a country.

1. The Mediterranean lands

The mild wet winters and warm dry summers of the Mediterranean lands make them ideal countries to live in.

The people of Southern Spain, Italy, Greece and North Africa enjoy the warmth, the clear skies and the vivid colours that are so attractive to northern visitors. In places, however, drought and poor soil cause widespread poverty. Other parts of the world with a Mediterranean climate are California and parts of South Africa and southern Australia.

In these lands, many kinds of fruit are grown, especially grapes, olives, oranges, lemons, peaches, apricots, figs and



A Mediterranean land: Southern France. Baskets of grapes waiting to be collected in the vineyards

grapefruit. Wheat thrives, as well as such crops as tobacco and cotton, and rice—where irrigation is possible.

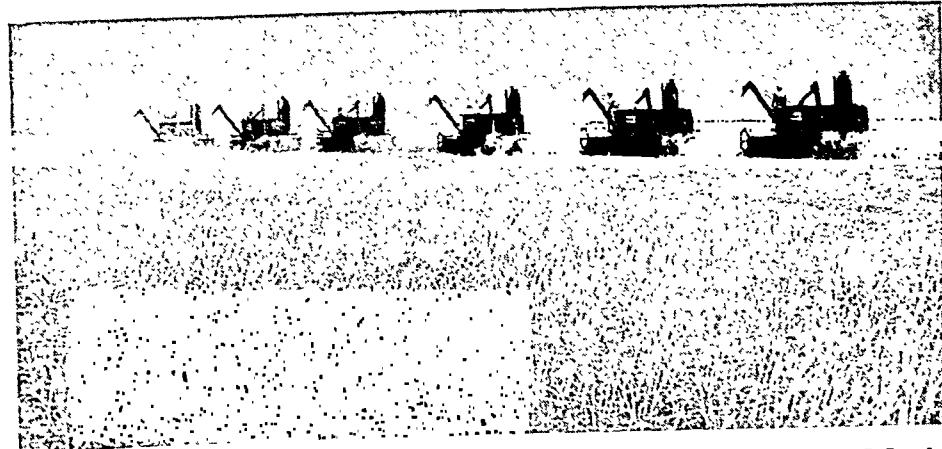
2. The cool temperate lands

Britain is said to have a "cool temperate climate". This means that it is never very hot or very cold. The average temperature is rarely over 70° F. or below 40° F. in any one month, and rain falls regularly throughout the year. This is mainly because the winds from the seas in the west cool the land in summer and warm it in winter. Many of the countries of Europe, as well as New Zealand, part of western Canada and the mountainous parts of Chile, are cool temperate lands. In these countries, sheep, cattle, pigs and hens thrive, and so do many grain crops such as wheat, barley and oats. The weather is rarely too extreme to make work difficult, and the cool temperate lands contain some of the most important industrial countries.



A cool temperate land: England

Continental grassland :
Dakota,
U.S.A.
Harvest time
on the wheat
plains



3. The continental grasslands

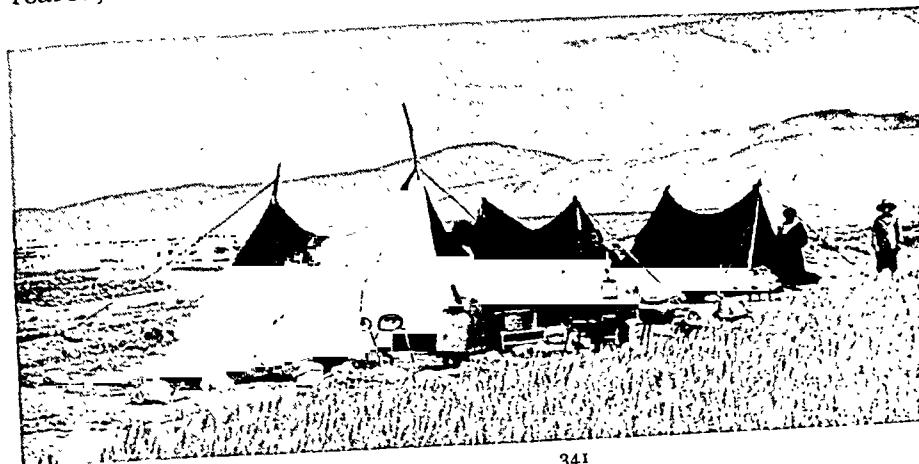
In the centre of large continents, far from the sea, the summer is usually very hot and the winter very cold. Temperatures often rise above 90° F. in summer and fall below 0° F. in winter. The prairies of central U.S.A. and Canada and the steppes of Russia are the biggest continental grasslands, where crops of wheat, barley, oats and rye are grown during the summer.

South of the equator there are similar lands : in the Argentine pampas, the South African veld, and part of eastern Australia. These are mostly rolling grasslands with few trees. In South Africa and South Australia sheep are reared, and in Argentina cattle are

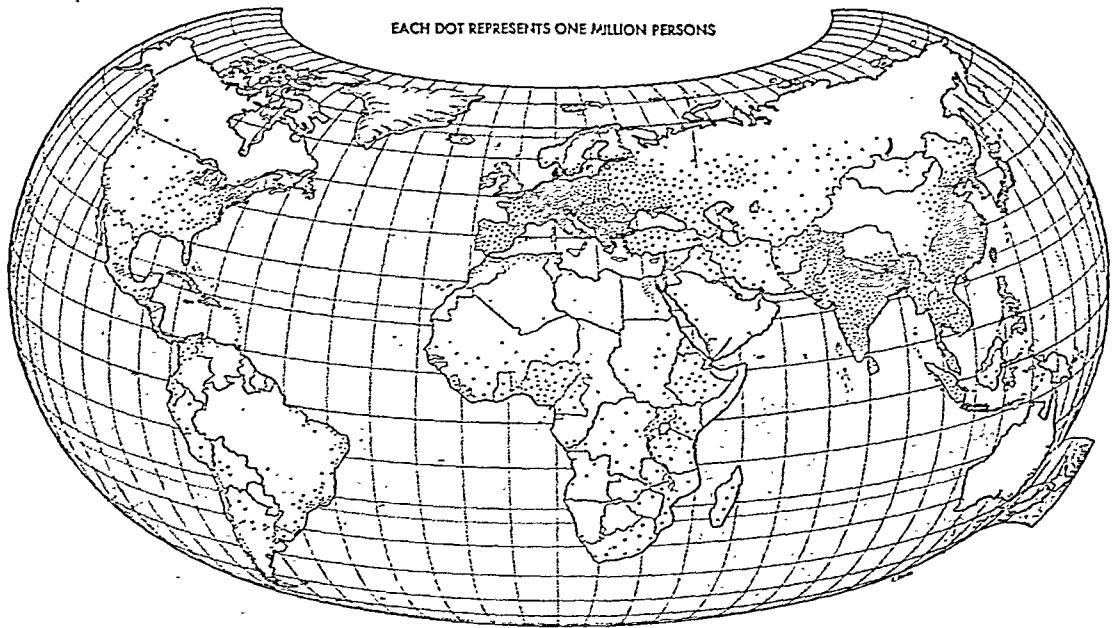
reared and grain is grown. Much wheat is grown in the South Australian grasslands.

4. The deserts of temperate lands

The centres of large areas of land in temperate regions are cut off from rain-bearing winds by distance, and often by mountains as well. These places are deserts, hot in summer and very cold in winter. Such regions are part of central North America, the Gobi desert of Mongolia, Tibet, Iran, and the Patagonian desert of South America. Few people live in these areas, but more may go to them if prospectors find the minerals for which they are searching.



A desert in a
temperate
land : Tibet.
This plateau
is 15,000 feet
above sea level



This map shows how the people of the world are spread unevenly over the world's surface. Many people live in the north-east of the U.S.A., in Europe, in India, in China and in Japan.

5. East coast lands

The east coasts of the continents of the world have a more extreme climate than the west coasts, with hot summers and cool or cold winters. (Most winds

are west winds. In the west of the continents they blow from the sea ; in the east they blow from the land, which is hotter in summer and cooler in winter.)

Eastern Canada and the east of the U.S.A., Japan, Natal and the south-east of Australia are east coast lands.

Nearer the equator, as in South China and Queensland, heavy summer rains allow rice and sugar cane to be grown. Cotton is grown in the south-east of the U.S.A., and coffee in Brazil.

In Manchuria and eastern Canada the winters are much colder, and rivers, such as the St. Lawrence, are frozen in winter. There is less rain, but mixed farming and dairy farming are carried on.

In many east coast lands, farmland is giving way to factories.



An East Coast land : Vermont, U.S.A. Vermont is often called the "four-season State", because of the great contrasts between its seasons

SECTION THREE: THE COLD LANDS AND SEAS

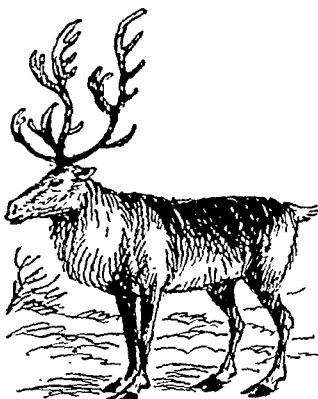
18. THE NORTHERN LANDS AND SEAS

The tundra

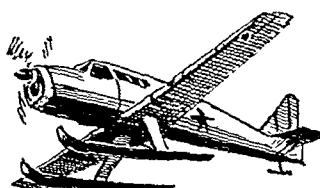
Huge plains, the *tundra*, stretch for thousands of miles across the north of Russia, Scandinavia, Canada and Alaska. Here, the long, dark winters are bitterly cold, and the rivers flow for only about three months in the year. The sea is ice-covered except for a few weeks in the summer.

Very few people live in these lands. In the past, they earned a living mainly by fishing, hunting and keeping herds of reindeer. Today they are learning to help in the search for minerals, and are trading furs for rifles, radios and tins of food.

How glad the people of the Arctic are when their three months' summer comes. For many days the sun never sets, the temperature may rise to 100° F., and in places the moss-covered plains are carpeted with small flowers. The air is alive with the sound of birds, and brightly coloured moths fly over the Arctic meadows.



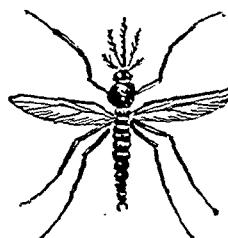
A reindeer



A plane fitted with skis



But even in summer it is difficult to travel across much of the *tundra*. A few feet below the surface the earth is still frozen, and when the water from the melting rivers overflows, it cannot soak into the ground. The marshes formed in summer by these melting rivers are the breeding grounds of swarms of mosquitoes, which make life unbearable for any traveller who tries to go through the swamps.



A mosquito

Alaska

A hundred years ago the territory of Alaska, in North America, was so unimportant that it was sold by Russia to the United States for less than two million pounds. Today it is one of the most valuable states of the U.S.A. In area it is ten times as large as England and Wales, yet only 167,000 people live there.

Fishing and mining make the wealth of Alaska. The rivers teem with salmon, which are tinned and sent to other countries. Off the coast, cod, herring and sardines are caught. Quick-freeze plants have been built so that fresh fish can be sent to the mainland of the U.S.A.

Gold, copper and platinum are the most important minerals of Alaska, but coal and other minerals are also mined. Forestry and fur trapping are becoming important.

Alaska has a very varied climate. Warm south-west sea currents give southern Alaska a mild climate. Most



The Alaska Highway, when it was being built. Notice the windmill used to generate electricity for the camp



Taking gold ore from a furnace, at Yellowknife, Canada

of the people live there, rather than in the cold interior or in the north. All the towns are in the south : Anchorage, Fairbanks, Ketchikan, and Juneau the capital. They are modern towns with blocks of flats, electricity, supermarkets and hotels. But life is expensive, for nearly all the necessities of life, and all the luxuries, have to be brought by ship or plane from the mainland of the U.S.A.

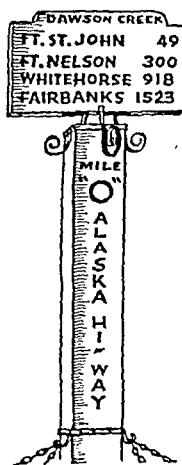
Because Alaska has become so important in recent years, a road has been built from the U.S.A., through Canada, to Alaska. The road is called the Alaska Highway. It is 1,600 miles long, and is open all the year round, though motorists take spare parts, food and extra clothes in case they break down when they are miles from civilisation.

Canada

Much of northern Canada is a country of lakes and coniferous trees, but in the far north it is too cold even for trees. The native people are Eskimos and North American Indians who, in the past, made a living by hunting and trapping animals for their furs, including the otter, musk rat, white fox, beaver, marten and ermine.

Nowadays the Eskimos and Indians are learning how to become miners and mechanics, to work with drilling machines, grabs and caterpillar tractors. Gold has been found near Yellowknife, and silver and pitchblende (from which uranium is obtained) near the Great Bear Lake. Oil, lead and zinc have also been found.

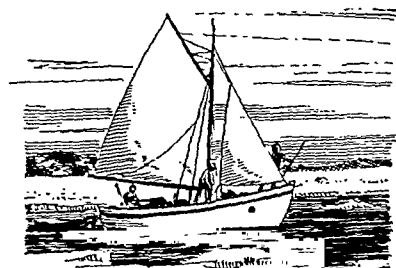
There are few roads and railways in this part of Canada and planes are used for much of the survey work which is necessary in the search for minerals. The planes are often fitted with skis, so that they can land on the frozen snow.



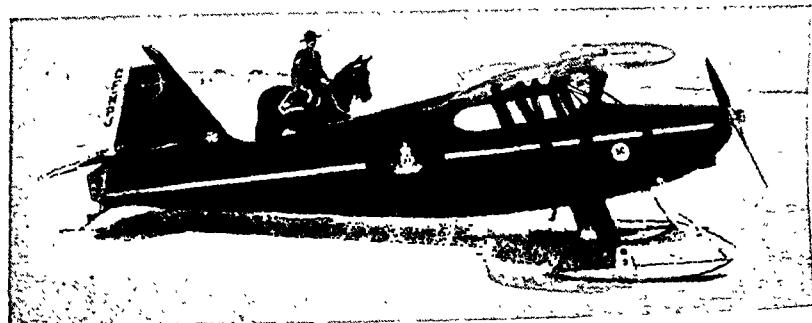
The Alaska Highway stretches for 1,523 miles, from Dawson Creek in British Columbia to Fairbanks in Alaska



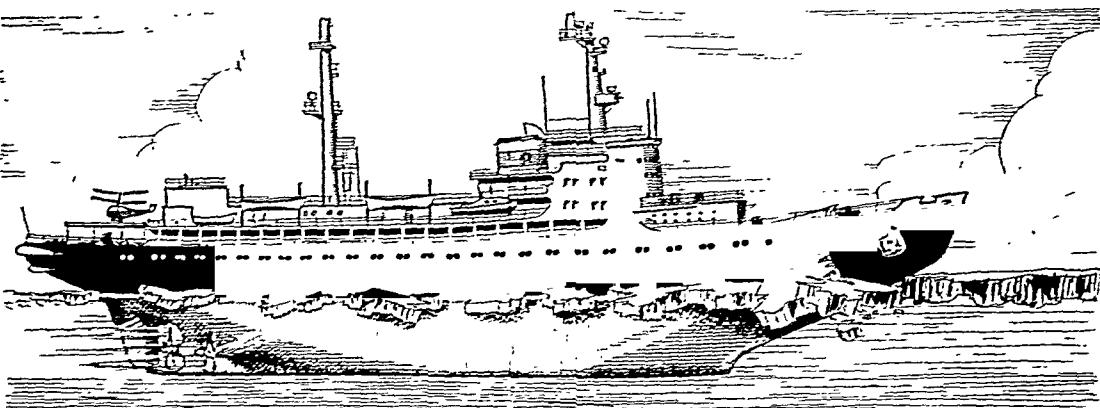
A Chipewyan Indian uses a geiger counter to test for radio-active minerals



The more prosperous Eskimos of the Canadian Arctic own Peterhead cutters, fitted with petrol engines and auxiliary sail



In the far North the Mounties use radio-equipped aeroplanes



This Russian ice-breaker is atomic powered. It can stay at sea for two to three years, since it uses very little fuel. As the propellers force the ship forward, the sloping bows are pushed up over the ice, and the weight of the ship breaks the ice, so making a way through

"Opening up" the north of Canada

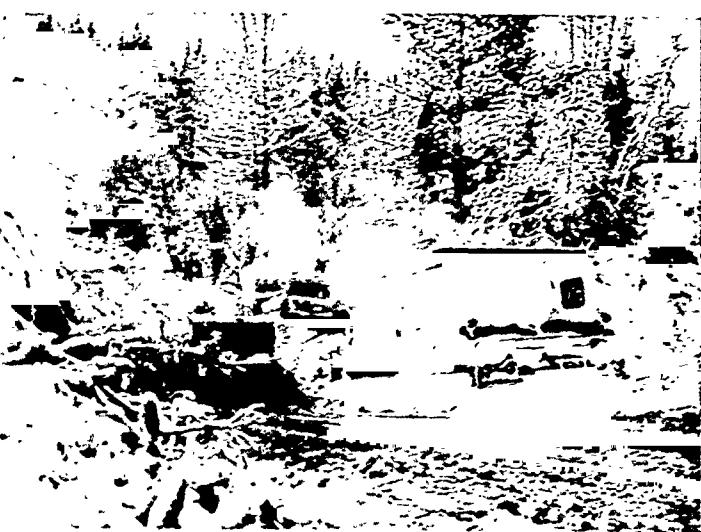
Roads are being built, and the 385-mile Mackenzie Highway now runs from Edmonton to Yellowknife. Road-making is difficult because the ground is frozen solid for most of the year, and roads tend to crack when the ground thaws. Rivers are being dammed to provide hydro-electric power.

Northern Russia and Siberia

Today, in some parts of the far northern wastes of Russia, minerals such as coal, oil and gold are mined. New towns have been built, with power stations to generate electricity. The Government wants people to make their homes in these parts, but first there must be food for them to eat. Russian scientists are experimenting with different varieties of grain, fruit and vegetables. Crops of sugar-beet, wheat and oats are being grown.

The northern seas

There are no regular shipping routes to the north of Russia and Canada. The north-west passage (the route round the north of Canada), and the north-east passage (north of Russia), are frozen up for most of the year. Each country has ice-breaker ships which force a way through the summer ice, helped by helicopters which look for weaknesses in the ice.



petroleum exploration team in the northern forests of Canada

The seas off Alaska and Norway are warmed by south-west sea currents, and so do not freeze in the summer.

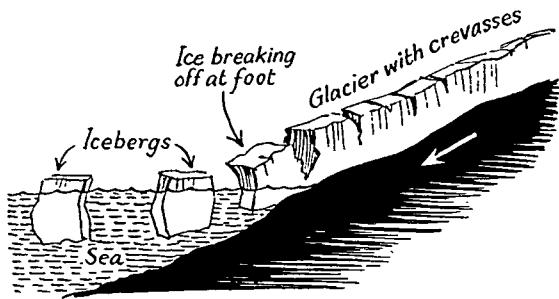
The North Pole

In the far north of the world, around the place we call the North Pole, there is no land, but only ice. In places, the ice is as much as two miles thick, yet it is never so thick that it rests on the sea bed ; it is always floating. (This was proved when the American atomic submarine *Nautilus* sailed right under the Arctic ice in 1958.)

Scientists have set up research stations on the polar ice, with huts, wireless sending and receiving sets, tractors and all kinds of modern equipment. They are studying the thickness and drift of the ice, the depth of the sea beneath it, and the weather in Polar regions.

Icebergs

In the northern seas are many icebergs which have broken off the edge of the polar ice, or off the ends of

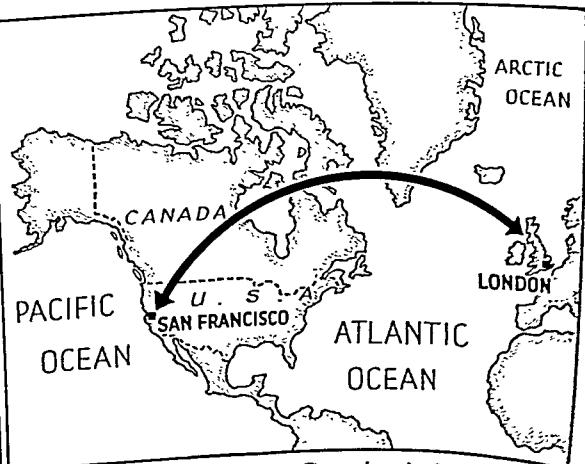
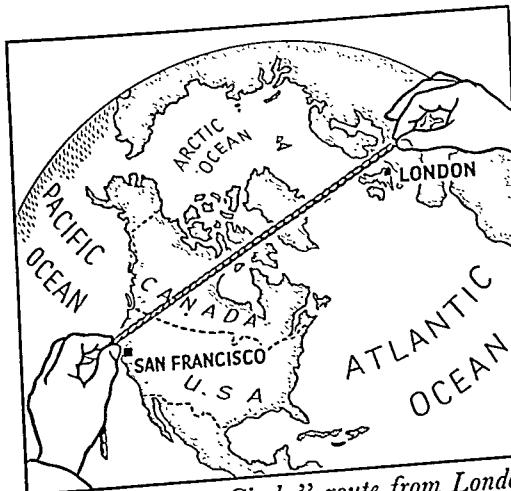


How icebergs are formed

glaciers. They are very dangerous to shipping, and from March to June each year, ships and aircraft of the International Iceberg Patrol keep watch for icebergs in the North Atlantic Ocean.

Arctic air routes

Airfields have been built as far north as Thule, in northern Greenland, where there is a large American base. Today there are regular passenger services by jet air-liner from Paris to Tokyo, crossing the polar ice. The journey takes 17 hours. Piston-engined planes on the usual route take 30 hours. Other Arctic routes are planned, since they are much shorter than the old routes.



The "Great Circle" route from London to San Francisco crosses Greenland. Similarly, the quickest way from Europe to Japan is over the North Pole.

19. THE ANTARCTIC

Why do men make expeditions to the loneliest and most dangerous places on earth? In the past most explorers were seeking gold, or new opportunities for trade, but modern explorers usually want the satisfaction of reaching distant places where nobody has been before.

Some explorers are scientists trying to find out more about the earth we live in. When Vivian Fuchs made the first crossing of Antarctica, the land of the South Pole, many of the men in his party were geologists or weather experts.

The Antarctic

Antarctica is a bleak barren land, almost as large as the U.S.A. and Australia together. It is much colder and higher than the Arctic, and no plants or animals live there, except for a few penguins and seals near the sea. The centre of Antarctica is a flat

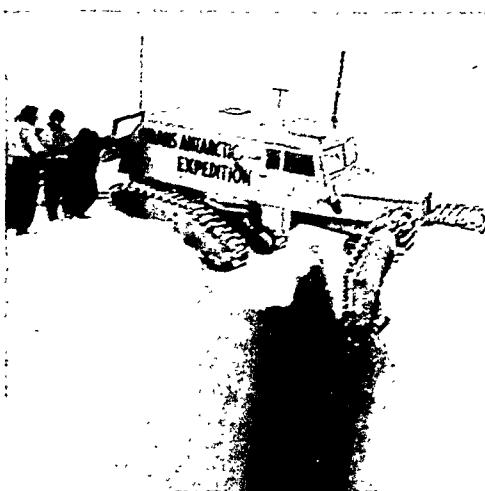


plateau 10,000 ft. above sea level, and the whole land is perpetually covered by ice up to 8,000 ft. thick.

Although the Antarctic is difficult to explore, several nations have sent expeditions to claim sections of the land. Later, other parties were sent to carry out research and to set up weather stations.

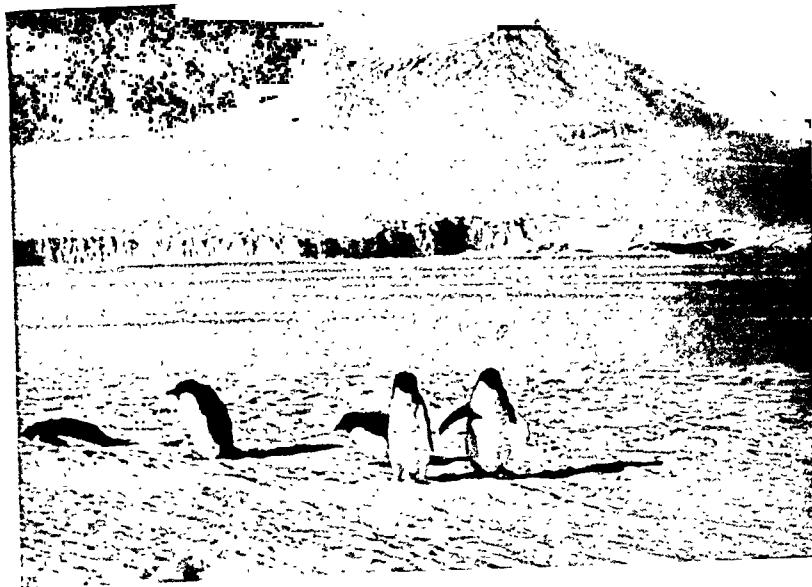


An explorer's dress in the Antarctic



A Sno-cat on the edge of a deep crevasse

Mount Erebus, Antarctica. Penguins are found only in the southern hemisphere



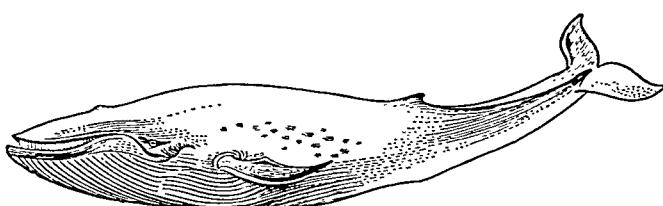
The first explorers in Antarctica—Shackleton, Amundsen and Scott—used only sledges to help their long treks across the icy wastes. When Vivian Fuchs led his expedition he used "snow-cats" fitted with caterpillar tracks, all kinds of special food, clothing, and equipment, and he was in constant wireless contact with his base. Planes reconnoitred his route and dropped supplies to him. Yet despite all this modern equipment, he was sometimes able to travel only about half a mile in a day. In all he travelled 2,230 miles before completing "the last great journey in the world".

WHALING

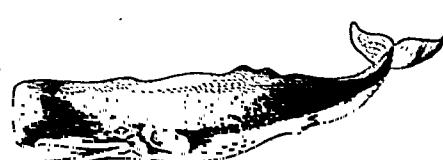
Whales

Whales are the largest animals in the world. A blue whale, fully grown, weighs as much as 17 elephants, i.e., about 100 tons. The fin whale, the humpback, the sperm whale and others are slightly smaller than the blue whale.

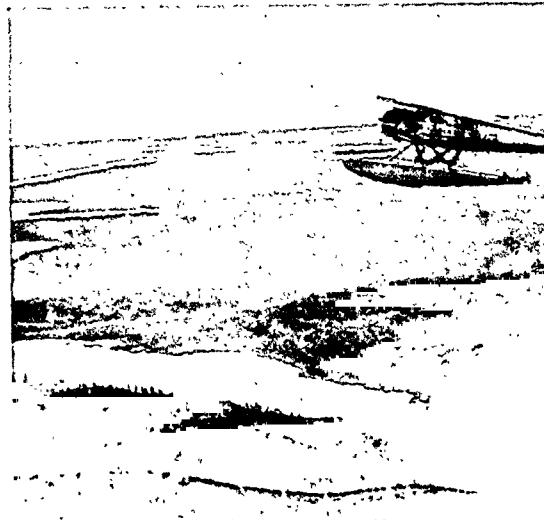
Whales feed on krill—small shrimp-like creatures which live in the cold seas. At one time whales were caught in the Arctic, but now the Antarctic is the only whaling ground.



A fully grown blue whale is as heavy as 17 elephants. It is 100 ft. long



A sperm whale may be as much as 65 ft. long



Let's Remember THE COLD LANDS

1. The cool forests

Most of Northern Canada, a wide stretch of Russia, Scandinavia, the mountains of New Zealand, and the very southern tip of South America, have cool summers and cold winters with snow. The countryside is covered with coniferous trees whose spiky leaves do not lose moisture: pine, deal, spruce and others. Few people live in these forests. Some of them hunt animals for their furs; others cut down trees, whose timber is made into paper, matches, furniture, rayon, and many other things. Today these areas are of interest to prospectors who are looking for such minerals as uranium and oil.

2. The tundra

In the cold lands far from the equator the ground is always frozen, except for the top-soil which thaws during the short summer. These lands are known as the *tundra*. No trees grow there, only mosses, lichens, and a few stunted bushes. The tundra lands include

northern Russia, northern Scandinavia, and north Canada and Alaska.

3. The frozen lands

Some lands are so cold that no plants or animals can live there. All the year round the ground is frozen solid, and covered with snow and ice. Antarctica, the plateau of Greenland, and the islands north of Canada are frozen lands, visited only by explorers, scientists and surveyors.



Tundra: in Finnish Lapland, where there are many reindeer

INDEX

(This index will help you to look up things quickly. The numbers refer to the pages of the book. When some of the page numbers of a subject are more important than the others, they are printed in **heavy type**.)

aborigines, 273
aeroplanes, 89, 115, 126, 139,
176-177, 227-229, 272-273,
343, 345, 347
Alaska, 344
alfalfa, 85
alligator, 18
allotments, 124-125
Amazon forest, 13-18, 74
Amazon, river, 13, 260, 299,
330
Andes, 330, 331
animals, wild, 17, 18, 20, 23,
268, 304
Antarctic, 348-350
anticyclones, 199
apartheid, 302
Arabia, 25-30, 138-141
Arctic, 343-347
Argentina, 83-86, 130, 330, 333
artesian well, 274, 298
Aswan Dam, 296
Atacama Desert, 331
atomic power, 165, 172, 239
auctions, 41, 137
Australia, 126-130, 250, 271-
276, 297
autumn, 5-6

bacon, 107, 213
bamboo, 43, 47
bananas, 81-82, 283
baobab tree, 274
barley, 213
barometer, 116
beef farming, 83-86, 214, 272
-273, 333
Birmingham, 174, 186, 224
blast furnace, 166
boats, 18, 23, 24, 47, 79, 246,
247, 249, 252, 260, 268,
282, 283, 285, 310, 316,
322, 332, 345
L.W.—24

Brazil, 118, 260-263, 299, 330
bread, 73
breadfruit, 282
bridges, 167, 175, 222, 232,
233, 234, 236, 296, 314,
316, 320, 321
Britain, *see* Great Britain
British Isles, 239
Brussels sprouts, 124
butter, 106, 202, 307, 313

Calcutta, 269, 270
camels, 26, 30, 328
campos, 261, 299
Canada, 70-73, 322, 345-346
canals, 59, 188, 247, 251-252
canning, 206, 208, 219, 278,
279
Capetown, 301
carrots, 125
cars, 173-174, 316, 319
cassava, 16, 282
cattle, 36, 37, 62, 83-86, 105-
106, 200-201, 247, 267,
271, 272, 278, 288, 297,
299, 313-314, 333, 335
Ceylon, 75, 134-137
chalk, 160
cheese, 106, 313
Chile, 330-332
China, 43-48, 87
clouds, 117
Clyde, river, 169, 171
coal, 48, 100-104, 161-164,
168, 174, 179, 182, 185,
188, 190, 191, 192, 193,
218, 223, 226, 231, 233,
234, 238, 239, 269, 276,
321, 324
cocoa, 286-287
coconuts, 283
coffee, 262
Colombo, 249

compass, 10, 109, 257
contours, 255
conventional signs, 254, 256
copra, 283
cotton, 87-91, 182-184, 192,
266, 277, 324, 329
crab, 217

dairy farming, 105-107, 192,
200-202, 210-212, 213,
232, 234, 236, 238, 313-
314, 335
date line, 259
dates, 29, 292
day and night, 194-196
Dead Sea, 290
deltas, 248, 268
Denmark, 105-107
depression, 199
deserts, 25-30, 247, 271, 272,
274-275, 290-291, 296, 297,
300, 329, 330, 331, 341
diamonds, 293, 302-303
Dieppe, 311
dingoes, 127, 273
docks, 80, 171
dredger, 80
drifter, 216-218
dustmen, 153-157

earthquakes, 309
earth's shape, 98-99
Egypt, 87, 295, 296, 301
electricity, 163-165, 188, 226
equator, 99, 249, 258, 299

Fiji, 281-284
fiord, 49
fishing, 18, 22, 52, 62, 110-
114, 215-219, 279, 282, 306,
344
flax, 185, 238, 334
flowers, 61, 207, 208, 209

forests, 13-18, 52, 260, 261, 275, 279, 286, 289, 299, 312, 323, 327, 330, 351
 fox, white, 20
 France, 311-312
 fruit, 58, 81-82, 203-206, 250, 261, 271, 275, 278, 283, 292, 297, 303-304, 315, 331, 340
 Ganges, river, 53, 264, 266, 268, 298
 gas, coal, 162-163, 326
 geysers, 339
 Ghana, 285-289
 glaciers, 49, 338
 Glasgow, 160, 171, 186, 224, 228
 glass, 317
 glasshouses, 61, 207
 gold, 276, 285, 289, 302-303, 344, 345
 grass, 213
 Great Britain, 148-239
 factories, 161-193
 farming, 34-42, 200-214
 fishing, 110-114, 215-219
 regions, 230-238
 transport, 220-229
 weather, 109, 197-199
 great circle routes, 347
 Greenland, 19-24
 hay, 38, 50, 51
 hemispheres, 99
 hens, *see* poultry
 Holland, 59-62
 hops, 206
 horses, 26, 83-84, 127
 houses
 in many lands, 93
 Amazon forest, 14-15
 Arabia, 27-28
 Australia, 126
 Britain, 93-97
 Ceylon, 135
 Chile, 332
 China, 43, 93
 houses—*contd.*
 Egypt, 93
 Fiji, 282
 Ghana, 286
 Greenland, 20, 23
 Holland, 60
 India, 54, 93, 265, 267, 268
 Italy, 316
 Japan, 308
 Malaya, 75
 Norway, 50
 Russia, 325, 326
 Sweden, 93
 U.S.A., Southern States, 90
 hydro-electricity, 165, 231, 239, 263, 280, 296, 309, 315, 324, 335, 337, 346
 iceberg, 347
 igloo, 20
 India, 53-58, 87, 118, 134, 184, 264-270
 Indonesia, 75
 Indus, river, 264, 297
 iron, 48, 166-168, 169-175, 192, 238, 322, 324
 Israel, 290-294
 Italy, 315-317
 jaguar, 17
 Jamaica, 81-82, 118
 Japan, 305-309
 Jerusalem, 294
 Johannesburg, 303
 jute, 248-249
 kayak, 23
 Kazakhstan, 328
 Kent, 153, 203-206
 Kibbutz, 292-293
 Lake District, 160, 198, 232
 latitude and longitude, 258
 leprosy, 289
 lighthouse, 246, 253
 lightship, 246, 253
 linen, 185
 Liverpool, 91, 160, 222
 lobster, 217
 lock, 251, 252, 322
 locomotives, 226
 Lombardy Plain, 316
 London, 160, 164, 186, 203, 224, 225, 228, 229, 236
 lorries, 220-222
 maize, 303
 malaria, 267
 Malaya, 75
 Manaos, 261
 Manchester, 160, 184, 186, 228
 manure, 40, 56
 Maoris, 334, 339
 maps and map-making, 31-33, 35, 131-133, 149-153, 254-259
 maps
 Antarctic, 348
 Arctic, 343
 Australia, 271
 Brazil, 330
 Britain, climate, 198
 coalfields, 161, 191
 fishing grounds, 215, 217
 fishing ports, 219
 highland and lowland, 198
 oil refineries, 163
 ports, 193
 rainfall, 198
 regions, 230
 Canada, 322
 Europe, 310
 Ganges, river, 266
 Ghana, 285
 Great Lakes, 322
 India, northern, 264
 Israel, 290
 Japan, 305
 Margate, 153
 New Zealand, 335
 Ordnance Survey, 151, 153, 254, *facing page* 256
 Pakistan, 264, 266

maps—*contd.*
 Russia, 324
 South Africa, 301
 South America, 330
 Suez Canal, 246
 U.S.A., 318
 North-East, 322
 Southern States, 277
 Venice, 316
 world, physical, front end-paper
 political, back endpaper
 population, 342
 Margate, 150–153
 markets, 41–42, 58, 86, 114, 205, 208, 209, 218
 market gardening, 61, 207–209, 234
 meat, 83–86, 214, 272–273, 333, 337
 Melbourne, 250
 Miami, 279
 milk, 36, 51, 201–202, 313
 millet, 265
 minerals, 263, 276, 281, 285, 289, 293, 302–303, 319, 324, 331, 344, 345
 Mississippi, river, 277
 monkey, 17
 monsoon, 53, 244, 300
 Moscow, 325–326
 mosquito, 15, 267, 343
 Murray, river, 297
 New York, 320
 New Zealand, 130, 250–251, 334–339
 Nile, river, 248, 295, 296
 nitrate, 331
 North Pole, 343, 347
 Norway, 49–52
 nuclear power, *see* atomic power
 nylon, 92, 184, 185
 oasis, 25, 30
 oats, 211, 238
 oil, 30, 138–141, 163, 172, 185, 193, 239, 245, 247, 248, 252–260, 280, 300, 346
 onions, 125
 opencast coalmining, 161
 oranges, 292
 Ordnance Survey, 151, 153, 254–256
 oxen, 56
 Pakistan, 134, 184, 264–270, 297–298
 pampas, 83, 330, 333
 Panama Canal, 251–252
 parrot, 17
 pearls, 306
 peas, 124
 petroleum, *see* oil
 pigs, 107, 200, 213, 214, 238
 pilots, air, 227
 pilots, sea, 80, 246, 247, 253
 Pitcairn Island, 251
 Pittsburgh, 321
 plans, *see* maps
 plateaux, 301, 302, 332
 Plimsoll line, 171
 polar bear, 20
 polder, 59
 Pole Star, 257
 poles, 99
 population, world, 342
 Post Office, 155–157
 potatoes, 37, 39, 192, 212
 pottery, 57, 187–189, 269
 poultry, 36, 107, 192, 213, 214, 238
 power, 161–165
 prairie, 70
 pruning, 135, 204
 Punjab, 264, 265, 297
 rabbits, 127
 railways, 120, 130, 152, 153, 156, 162, 164, 175, 218, 219, 223–226, 233, 272, 275, 310–317, 324, 332
 rain, 12, 40, 158–160, 197–199, 231, 237, 239
 rayon, 92
 refineries, oil, 141, 163
 sugar, 120
 reindeer, 343
 rice, 44–46, 55, 56, 269, 306, 307
 rickshaw, 48
 Rio de Janeiro, 263
 rivers, 78–80
 riveting, 170
 roads, 220–222, 319, 344
 roots, 34, 212
 rotation of crops, 210–211
 Rouen, 311
 rubber, 74–77, 261, 315
 Russia, 140, 324–329, 346
 saeters, 51
 savannah, 261, 288, 299
 schools, 33, 57, 62, 133, 263, 284, 327
 seals, 22
 seasons, 5–11, 13, 19, 30, 37–40, 194–196
 shadows, 10–11
 Sheffield, 175
 sheep, 29, 37, 40, 123, 126–130, 178, 200, 213, 214, 232, 236, 237, 238, 272, 275, 304, 312, 330, 332, 336, 337
 shipbuilding, 169–172, 231, 233, 308
 ships, 110–114, 115, 137, 141, 163, 164, 169–172, 193, 245–253, 287, 308, 310, 322, 346, 350
 shops, 24, 48, 57, 58, 68–69
 silk, 44, 307
 snakes, 17
 Snowy, river, 297
 South Africa, 130, 301–304
 South America, 330–333
 South Pole, 99, 348
 spinning, 91, 178, 180, 182
 spring (season), 8

spring (water), 78, 160
 St. Lawrence Seaway, 322
 steel, 166-168, 169-175, 177,
 238, 270, 319, 321
 steppes, 327, 328
 Sudan, 87
 Suez Canal, 246-247
 sugar, 118-121, 278, 283, 299
 sugar beet, 121, 211
 Sukkur barrage, 298
 summer, 9
 sun, 10-11, 194-196, 197, 198
 Switzerland, 312-315
 Sydney, 130, 195, 250, 276

tailoring, 186
 tapir, 17
 tea, 134-137, 269, 307, 329
 textiles, 178-186
 Thailand, 75
 thermometer, 116
 timber, 261, 275, 279, 289,
 309, 312, 313, 323, 351
 time, 259, 310, 312
 tin-plate, 168, 174, 238
 tobacco, 278
 tomatoes, 207, 208

tonnage, 171
 toucan, 17
 trapping, 279, 345
 trawlers, 110-114, 215
 tsetse fly, 288
 tundra, 327, 343, 351
 tunnels, 222, 233, 297, 315

United Kingdom, 239
 uranium, 276, 303, 324
 U.S.A., 87-91, 140, 318-319
 north-east, 319-323
 Southern States, 277-280

U.S.S.R., *see* Russia

Venezuela, 140
 Venice, 316-317
 volcanoes, 281
 Volta, river, 288

walrus, 23
 water, 12, 25, 30, 45, 55, 119,
 127, 158-160, 164, 165,
 178, 179, 233, 237, 248,
 265, 275, 288, 289, 291,
 295-298, 329

water-buffalo, 45

water power, 161, 165, 179,
 182, 296
 weather, 115-117, 197-199,
 239
 weather vane, 109
 weaving, 180, 182, 183
 welding, 170
 Wellington, 250
 wells (water), 25, 127,
 267, 274, 298
 West Indies, 81-82, 87, 118-
 120
 whaling, 349-350
 wheat, 70-73, 192, 210, 212,
 235, 265
 windmills, 59, 60
 wind-rose, 109
 winds, 108-109, 197, 198, 199
 winter, 7
 wool, 29, 126-130, 178-181,
 192, 232, 272, 304, 324,
 337
 woomera, 274
 Woomera, 275
 Yangtse, river, 47
 zebu, 267